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LESSONS *of the* SANTA BARBARA EARTHQUAKE

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Photographs by J. Walter Collinge and the Author

ON the morning of Monday, June 29, the city of Santa Barbara, California, situated on the Pacific Ocean approximately 100 miles north of Los Angeles, and 350 miles south of San Francisco, was visited by a severe earthquake. The first and by far the most intense shock came at 6.43 A.M., lasted 15 seconds and was followed in approximately two minutes by a second shock of almost equal intensity but lasting only 10 or 12 seconds. Settling shocks, so called, continued at intermittent intervals for the remainder of the week following, but the entire damage to buildings was caused by the first two shocks.

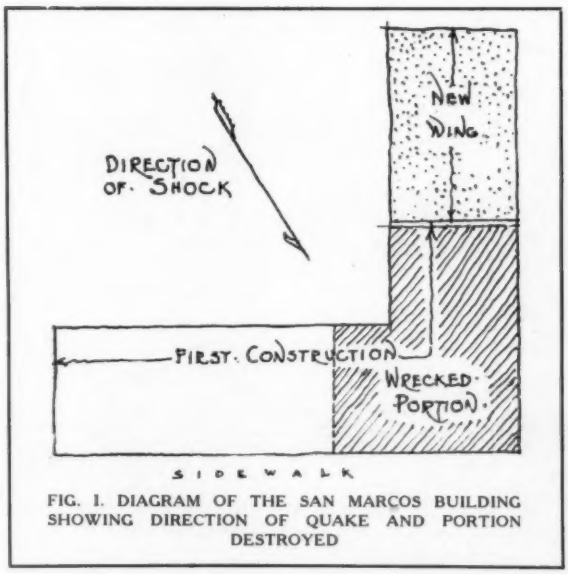


FIG. I. DIAGRAM OF THE SAN MARCOS BUILDING SHOWING DIRECTION OF QUAKE AND PORTION DESTROYED

Before discussing the damage caused by the temblor, the reader should be conversant with the physical topographical situation of the city of Santa Barbara. At this particular spot the coast line of the state of California, which in general runs north and south, takes a sharp curve to the west so that the shore line here runs due east and west, the Pacific Ocean lying to the south of the city. Directly parallel with the shore line and some seven miles due north of the coast the mountain chain known as the Coast Range, averaging some 4000 feet in height runs east and west parallel to the shore, the land rising gently to the foot of the mountain range and there sharply to its summit. Owing to the topography of the slight depression in which the city lies, the main street of the city, known as State Street, runs in a northwest and southeast direction and as the city is in the main, laid out in the usual square block plan the cross streets run northeast and southwest.

This fact is of particular interest because the apparent source of the slip which caused the temblor was almost directly north of this city so that the shock travelled approximately north to south, while the rebound which caused practically all of the damage travelled from south to north or approximately on the diagonal of the city blocks and all the buildings.

Another factor influencing the damage to structures, which must be carefully considered in connection with the quake is the condition of the ground on which the buildings stood. Three distinct classes of soil conditions exist in Santa Barbara, as follows: 1. Bed Rock. 2. Hard Pan. 3. Soft silt or marsh muck. Professor Baily Willis of Stanford University, noted geologist and seismologist, in discussing the question of soil condition stated that the relative intensity of the shock as communicated to structure was roughly as follows: considering the intensity of the shock on bed rock as 1. The intensity of hard pan would be 10 and on silt or marsh muck 20. It must, therefore, be at once apparent that the damage to any structure or type of structures would be almost directly in ratio to the class of soil on which they stood.

The destruction to buildings caused by the quake was general, the main damage of course occurring to the larger structures which bordered State Street several blocks east and west and extended approximately a mile and a half up from the beach. In the outer or residential districts the

damage was confined almost exclusively to broken or fallen plaster and to falling chimneys and the havoc caused by the same.

After a careful survey of the wreckage caused by the quake it became apparent that many lessons

FIG. 2. SHOWING DEMOLISHED CORNER OF SAN MARCOS BUILDING

are to be learned from the condition as existing in Santa Barbara and for purpose of discussing these logically let us take up the different forms of construction existing here and review each in respect to the damage caused by or resistance to the earthquake.

STEEL FRAME BUILDINGS: It is unfortunate that there were not more steel frame buildings existing in this city at the time of the quake as, had they been more extensive, the ability of this

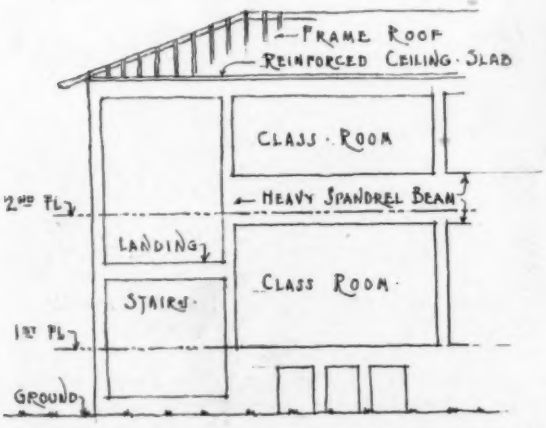


FIG. 4. DIAGRAM OF STRUCTURAL FRAMING OF WILSON AND LINCOLN SCHOOLS

type of structure to withstand temblors would have been more conclusively proven.

There were, however, two buildings of this type in the city. The public Bath House, a rambling two story building situated at the beach on the worst type of marsh muck foundation; and the (new) Christian Church of the basilica type, nave and side aisles, in the upper end of the city, on good hard pan foundation. These buildings came through the quake practically intact except for slight plaster cracking, the intensity of the temblor at the Christian Church being demonstrated by the fact that the upright piano which was left at the edge of the stage in the auditorium, was found standing neatly balanced on its top on the auditorium floor.

REINFORCED CONCRETE BUILDINGS: There were many buildings of this type in the city, varying from 2 to 8 stories in height, and a careful inspection of them shows many facts of interest.

FIG. 3. SHOWING DEMOLISHED TOWER OF ARLINGTON HOTEL

Four of these buildings, the San Marcos Building; the Arlington Hotel; the Wilson and Lincoln Schools (the latter two duplicate buildings from the same plan); and the St. Francis Hospital showed signs of partial or total failure and we will take these buildings up in the order named.

The San Marcos Building stands on the corner of two of the principal business streets, is a typical four story office building containing wide faced stores on the ground floor and three stories of typical offices above. It is peculiar in the fact that it was built at two different periods. The original building was erected about 1913 and con-

sisted of approximately 225 feet front on State Street and a right angle wing of approximately 100 feet on Anapamu, the cross street. In 1923 an extension to the Anapamu Street wing was constructed which was approximately 125 feet long making this completed building almost a symmetrical ell shaped structure (Figure 1). At the first shock of the earthquake the main street corner of the building collapsed, carrying the entire corner of the structure to the ground, as shown in the accompanying photograph (Figure 2). This collapse was undoubtedly due to the fact that in constructing the new addition to the building, no attempt whatsoever was made to tie the old and new structures together, the form work for the new wing being placed against the existing building and the concrete poured against the dry wall of the old building. As has been noted above, the direction of the temblor was approximately on the diagonal of the building. The shock, which lasted for 15 seconds, evidently set up different vibrations in the two portions of the structure and the new wing acted as a battering ram on the stiffer or corner portion of the old building, causing total collapse of the corner. This collapse was undoubtedly abetted by the fact that the concrete in this portion of the structure, upon examination after the quake, was found to be of mediocre quality, with a low proportion of coarse aggregates.

FIG. 7. COUNTY COURT HOUSE, SHOWING DIAGONAL FAILURE OF BRICK WALLS

The Arlington Hotel failure was directly traceable to another cause. This was a rambling, picturesque, Mission type building and contained a large tower at one side of the main gable; a utilitarian, as well as artistic feature, for the tower concealed an 80,000 gallon water tank. This tank was the cause of the collapse of this corner of the building, as the side sway of the quake evidently caused the collapse of the columns on the unsupported or outer face of the structure, the entire tower and portions of the abutting structure crumbling to the ground (Figure 3). The columns supporting the tank were undoubtedly of correct design and of sufficient size to carry the dead load, but failed through lack of ability to withstand the beam action caused by the quake vibration.

The Wilson and Lincoln Schools, two story and basement, although they did not collapse, were very seriously damaged structurally. This was apparently due to a feature of their structural

FIG. 8. TYPICAL DESTRUCTION OF BRICKWORK

FIG. 6. TYPICAL DESTRUCTION OF BRICK FRONT

FIG. 5. SHOWING TYPICAL DESTRUCTION OF TERRA COTTA WALLS WITHOUT INJURY TO FRAME

FIG. 9. CALIFORNIAN HOTEL, SHOWING ENTIRE DESTRUCTION OF BRICK RETAINING WALL

design. These buildings contained the normal standard grade school classrooms, the maximum of window area demanding a wide spacing of the structural columns, this spacing in turn requiring a very heavy exterior girder to support the floor loads, which girder, on account of the height of the window heads below, was designed in the form of a spandrel beam, occurring mainly above the floor level. At the ends of the building were the two stairways, and on account of the construction of these stairs the spandrel beams were not carried across this last bay. The damage to these buildings occurred mainly at the columns of the last bay adjacent to the stair wells, probably due to the fact that the mass of the building was not homogeneous (Figure 4). Had the heavy spandrel beam been run around the stair well it is doubtful if these two buildings would have sustained any serious structural damage.

It would have been extremely interesting from a seismological standpoint had these two buildings, built from a single plan, within a month of each other and by the same contractor, been oriented at right angles to each other, so that the shock might have acted along one building and across another, thus establishing the resistance to the thrust on the major and minor axes, but unfortunately this was not the case.

The St. Francis Hospital, four stories, situated on a steep hillside, but oriented directly east and west on its long axis, in other words set at an angle of 45 degrees with the rest of the buildings mentioned, was seriously damaged structurally by the temblor; although the structure of the building did not actually fall, it is badly shattered, the floor slabs, columns and girders all showing serious cracking and the terra cotta filler walls both exterior and interior were seriously damaged and many were thrown down.

There were many other reinforced concrete structures throughout the city which showed slight damage only and these may be divided into three classes, namely: Those with concrete filler walls; those with solid 13″ brick filler walls; and those

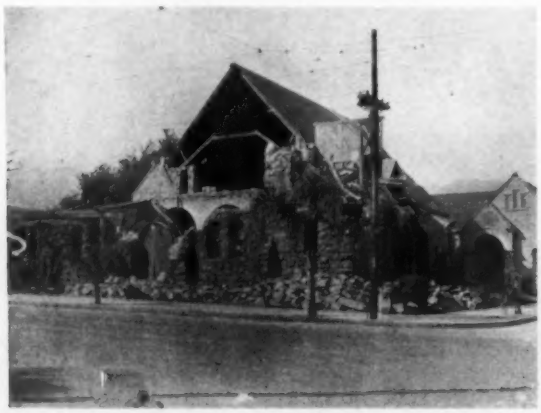


FIG. 10. UNITARIAN CHURCH, TYPICAL EXAMPLE OF DESTRUCTION OF STONE CONSTRUCTION

FIG. 11. CATHOLIC CHURCH, SHOWING DESTRUCTION OF ADOBE BUILDING, BRICK VENEERED

with 6″ x 12″ terra cotta filler walls. The first two classes in general suffered little or no damage, but, when damaged, suffered at the intersections of the structural members, not in the filler walls, it being evident that the filler walls were so rigid that they refused to cushion the shock and transmitted it directly to the structural members, thus increasing the strain on them and causing failure. Buildings of the third class suffered, as a rule, serious damage to the filler walls, but little or no damage to the structure as the shock was cushioned by the filler walls, which failed, saving the frame from serious damage (Figure 5).

Brick Buildings: The damage to brick buildings was perhaps more evident than that to the two former types, because of two factors; first, because there was in this city, as in every other, a great deal of poor construction in brickwork; and secondly, because brick buildings far outnumbered all other types of construction in the business district. Parapet walls above the flat roofs in the business district were generally thrown down, often causing serious damage to adjoining buildings, at a lower level and literally covering the sidewalks for blocks. Brick fronts of store buildings were generally thrown out, while the longer side walls were intact, showing that some mechanical bond is necessary other than the simple bonding of brick to brick (Figure 6). Where failure of the brick walls was not total, the cracking in the form of a cross from one corner to another was almost universal as shown in the accompanying photograph (Figure 7) of the old court house indicating the oscillating motion of the temblor. In brick buildings, as in all others, serious damage occurred where the brickwork was of mediocre or poor character; where weak mortars were used with too fine a sand; where the brick were not wet before being laid; and where the joints were battered on the edges, instead of being laid in a full shoved joint (Figure 8). It seems unfortunate that brick masons themselves all over this country, do not seem to be aware of the danger to the public from poor workmanship and materials as employed in their trade.

A glaring example of this type of construction and the resultant damage is shown in the accompanying photograph of the Californian Hotel (Figure 9). This building was situated in the lower portion of the city, near the beach and on the worst type of marsh muck soil. The footings were set in a shallow trench directly on the ground, there being no basement of any description in the building. Three of the four walls of the building were thrown to the ground, the fourth badly shattered and leaning dangerously. Why the portion of the building supporting the walls and floors interiorly did not follow, is a mystery.

On the other hand, well constructed brick buildings suffered little or no damage from the quake, a notable example being the old St. Vincent's Orphanage building, four stories high, built about 1875, before the days of cement mortar, which scarcely shows a crack in the brickwork, while a one story, 13″ brick wall power house and laundry erected on the same property some ten or fifteen years ago is a complete wreck. The only brick building in the city constructed with the modern light pressed steel joists and light concrete slab on expanded metal, does not show even a crack in the plaster, whereas the two buildings on each side of it are seriously injured and it would seem that this type of construction is particularly well suited to withstand the shock.

FIG. 12. SHOWING DESTRUCTION OF ONE OF THE OLDER ADOBES

Stone Buildings: Buildings constructed entirely of local sandstone or of stone backed with brick did not withstand the temblor very well. Most of these buildings, many of which were in the business district, were built before the days of cement mortar and owing to the unevenness of the stone beds and the poor quality of the mortar suffered considerable damage. In many cases the stone facing of the building detached itself from the side walls, generally of brick, and fell as a unit to the street (Figure 10).

Terra Cotta Buildings: Buildings with structural walls of 6″ and 12″ terra cotta blocks, strange as it may seem, withstood the shock surprisingly well. Of course, there were very few such buildings on State Street, as the building ordinance called for 13″ brick walls in this district, but the one building in this district having 12″ terra cotta walls, laid in what is known as "Garden Wall Bond," (that is an outer and inner

row of 4 x 12 x 12 tile with a 12″ header through the wall every other tile, headers staggering on each successive course) shows little or no effect of the quake.

The writer's office designed and built exclusively for the firm's occupancy, a building of two stories in this construction, and two private residences built in the same way suffered no damage except to the chimneys.

Many bungalows in the city are constructed with 6 x 12 x 12 terra cotta blocks to form a 6″ wall, plastered directly on the terra cotta inside and out and this construction, where it was set on the proper foundation, came through the quake, on the whole, as well as the frame construction.

Concrete Block Buildings: Adjacent to the business district there were many buildings, such as small garages, stores and warehouses, which were constructed of 6″ and 8″ concrete blocks. These buildings, where the same were built in competition with brick and were not constructed under the supervision of a competent architect or engineer, were almost generally uniform in showing decided failure and in many cases even total collapse.

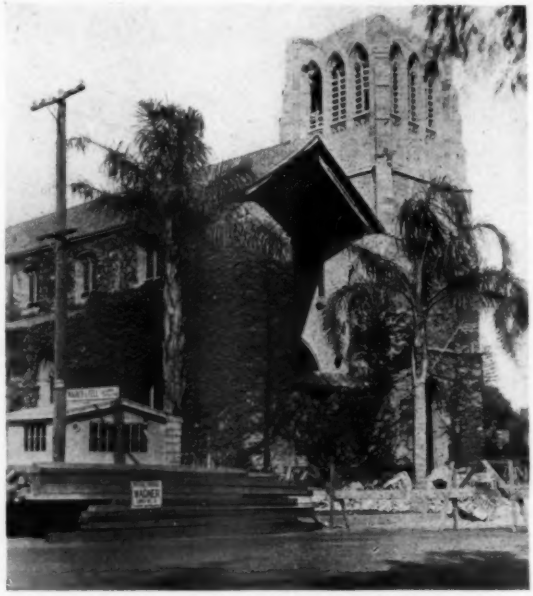


FIG. 13. TRINITY CHURCH, SHOWING DESTRUCTION OF END WALLS IN BASILICA TYPE BUILDING. STONE CONSTRUCTION

Inspection of these buildings proved that this was due to three facts: Poor mortar, poor sand (generally beach sand) and failure to wet the blocks properly before they were laid.

Where the blocks were properly wetted, soaked is a better word, and were laid up in a rich cement mortar with properly designed reinforced concrete tie course at the plate line, this type of building showed surprisingly little damage.

Frame Buildings: Frame buildings of every variety from residences to warehouses and apartments suffered little or no damage from the quake. Where frame buildings were on insufficient foundations, or where the plates and sills had rotted from extreme age, some shifting of the house occurred, in places as much as 6″ being observed, but where the foundations were adequate, even though the house was old, little damage occurred. In many of the older residences, practically all of the plaster was shaken from the walls, although the frames were undamaged; this was probably due to the decay and ageing of poor lime plaster, as little or no damage was caused in the buildings having the modern quick settling patent plasters. The main damage to residences and other frame buildings was due to falling chimneys and these, particularly where they were free standing on the exterior walls, were thrown down, almost without exception. There were few of the so-called "patent or earthquake-proof" chimneys, but these all came through the temblor intact and a special amendment has now been added to the building ordinance of the city permitting this construction.

Board and Bat Construction: There is one other type of construction peculiar to California, which should be mentioned in connection with the quake and that is the so-called "Board and Bat." This consists of 1″x12″ boards, nailed at the bottom on the outside of a platform frame and on the top to a 2 x 4 plate, supporting the roof, with no studs of any kind, the cracks between the boards covered on the inside and out with ½ x 3″ battens. This construction, as it is very cheap and flimsy, suffered considerably from racking and twisting, but on account of its extreme flexibility did not collapse.

Adobe Buildings: Although not of general interest to the country at large, a word should be added here covering the one construction that is peculiar and indigenous to the state, the so-called "adobe construction." The adobe buildings built in recent years showed little damage while those of greater age were practically all demolished (Figure 11). In the writer's opinion this is due to two factors: First, the older buildings had little or no foundation, many of them being set on a single course of rubble stone laid directly on the ground, where the buildings of later construction were set upon heavy concrete foundations. Second, the older buildings had dried thoroughly, leaving the adobe mortar, in which the bricks were set, in a dry and pulverized condition (Figure 12), so that the temblors caused the adobe bricks to slide on each other; whereas, in the

newer buildings the mortar in the center of the walls (often three feet thick) was still moist and tended to cement the bricks together, as well as to cushion the shock.

MIXED CONSTRUCTION: Many of the buildings in the devastated district were of mixed construction; that is, of concrete and brick, brick and tile, brick and stone, etc., where both materials were used structurally. Almost invariably these buildings were badly damaged, because the two materials did not have the same reaction to the temblors, thereby causing great strain at the point of joining, with resultant damage. As an instance of this, practically all the garages and repair shops in the city are identical in their construction, the trusses being carried on reinforced concrete columns tied together at the top with a reinforced concrete beam, the front and rear of the buildings being filled with brick or terra cotta filler walls. In the two cases known to the writer where the reinforced concrete beam at the top of the columns was carried continuously around the building tying in the front and back walls, the buildings were not damaged to any extent, whereas all the other buildings where the beam was not continuous lost both the front and rear walls. The danger of this mixed construction was also evidenced by the damage to stone and brick buildings as noted above.

FIG. 13. DAMAGE CAUSED TO CORNER OF COMMERCIAL BUILDING BY DIAGONAL TRUSSES

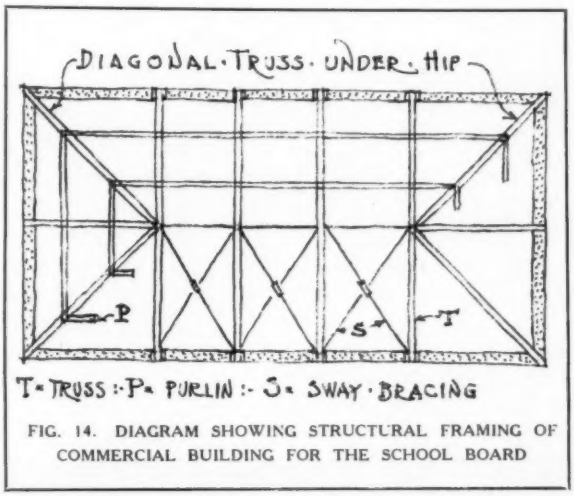


FIG. 14. DIAGRAM SHOWING STRUCTURAL FRAMING OF COMMERCIAL BUILDING FOR THE SCHOOL BOARD

TYPES OF DESIGN: Aside from the material entering into the construction of the building there is another factor which must be seriously considered in connection with the temblor and its resulting damage and this is the type of the structure, its shape, its size and the general arrangement of the plan and elevation.

All buildings of a compact rectangular plan, where braced by through cross partitions, came through the quake very well. Buildings with rambling plans and composed of varying masses, did not come off so well, as the vibrations set up by the temblor were different in the separate units, on account of their varying masses, with much resultant damage at the intersections of the different units. Buildings of the basilica type, with low side aisles and high central nave, suffered considerably on account of the lack of stiffening cross partitions, this type of building almost without exception throwing out their end walls, which seem to have been literally battered down by the action of the long clerestory walls against them, as shown (Figure 13).

An interesting single instance of the peculiar action of the quake may be seen in the small building constructed for the School Board for their commercial classes. On account of the requirements of the Board this building could have no cross partitions and it was therefore constructed as shown in the attached diagram (Figure 14). As a result of the oscillating motion of the quake the building seemed to pivot on its center, causing the diagonal trusses supporting the hips of the roof to rack the four corners of the buildings as shown in the accompanying photograph (Figure 15). Had the diagonal trusses under the hips been set on roller bearings, the building probably would have suffered no damage whatever.

Auditoriums and other structures of a similar type, where two story height and no cross partition were essential to the design, unless heavily buttressed on the outside under the truss loads and rigidly tied all around as frequently as possible, showed much racking, as might be expected.

Wide space, but low height, buildings such as garages, when well designed, as noted above,

came through the quake with little damage.

Tall buildings, that is four stories or more in height, suffered considerable damage from the oscillations or vibrations of the structure and it is of interest to note that the damage occurred at approximately one-third to one-quarter of the height of the building; in other words, at the point of greatest strain in a cantilever beam, for these structures all anchored solidly in the ground by heavy basements and swaying to the quake at their tops, were indeed cantilevers of great magnitude.

It is interesting to note that insofar as the writer's observation has extended, not one single instance of damage to any portion of any structure below the ground level has been observed. Although much breakage of fragile goods occurred, where the same were stored in basements, showing that the shock was severe below ground, yet no damage to the structure resulted. This is probably due to the fact that no vibration could be set up here on account of the supporting and deadening nature of the surrounding soil.

Summing up the damage wrought by the quake the following points become evident:

1. No damage from quake may be expected below ground level.
2. Damage to structures will be directly proportionate to the class of soil on which they are constructed and to the weight of the structure
3. Tall buildings fail by beam action at their point of greatest strain, ⅓ to ¼ of their height.
4. In designing quake-proof buildings, all columns, and especially those at ⅓ to ¼ of the height, should be examined for beam action as well as for dead load.
5. Wind bracing in skeleton frame is a great aid to earthquake resistance.
6. In concrete construction horizontal gussets joining floor girders and wall girders should be considered as best withstanding the twisting motion of the quake.
7. Filler walls in skeleton construction should be light in mass to prevent fracture of the structural members and as flexible as possible but rigidly anchored to prevent damage from their falling.
8. Great care should be exercised in structural design where unusually heavy loads are to be carried on the structure some distance above the ground.
9. For tall buildings steel frame construction would seem to be best on account of its resiliency.
10. In brick construction all walls should have mechanical ties at their intersections, all parapets should be anchored to roof, all chimneys should be thoroughly braced, no projecting brick cornices should be allowed: reinforced concrete bond courses under all joist bearings are strongly recommended.
11. Great care should be exercised in anchoring brickwork occurring above long span lintels over store fronts.
12. In wooden joist construction, joists should be carefully and thoroughly tied to the brickwork, preferably into a continuous concrete bond course.
13. In plan and elevation buildings presenting a unit of mass and possessing inherent stability will best withstand the temblors.
14. In arranging the plan continuous cross partitions are a great aid to quake resistance.
15. Mixed construction does not withstand the shock as well as unit construction.
16. Finally no matter what the type of building, *good material and good construction intelligently designed and rigidly inspected are the best insurance against earthquake damage.*

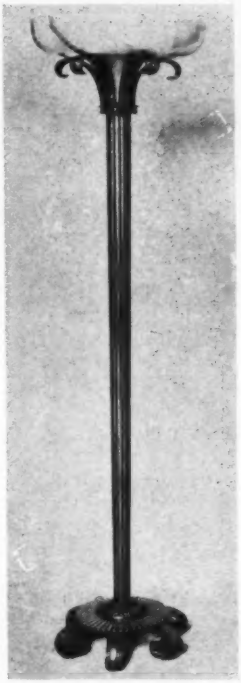
LIGHTING *at the* PARIS EXPOSITION

BY WALTER W. KANTACK

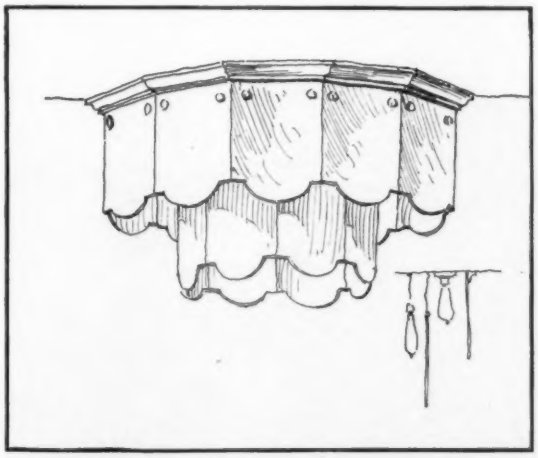
Designated by Secretary Hoover to report on the subject of Lighting and Lighting Fixtures at the International Exposition of Decorative Arts

THE electric lighting effects, shown in the International Exposition of Modern Decorative and Industrial Arts at Paris, are extremely interesting, instructive, and successful. This is the practically unanimous opinion of the American delegates to the exposition. No other phase of the exhibition has aroused more enthusiasm and comment. Throughout the miles of exhibits, there is a great diversity in the handling of the lighting problem. Indirect, semi-indirect, combinations of the two, spot-lighting, and lighting fixtures have been employed. The lighting fixtures, however, have assumed new and interesting forms. In almost every case the designers represented there have avoided any suggestion of the candle, oil or gas lighting fixtures with which we are so familiar. This is certainly as it should be in a modern exhibition, showing the application of modern theories of design to modern discovery and invention.

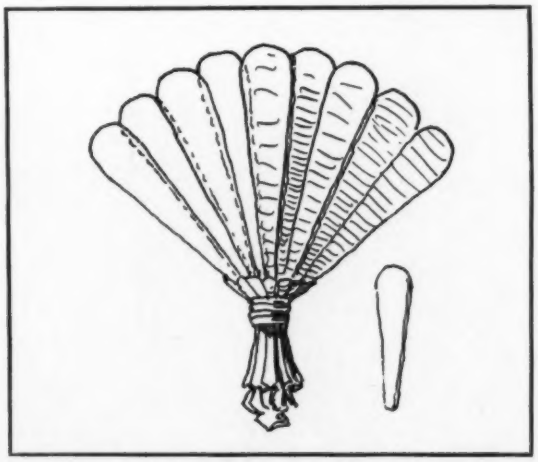
This variety in the lighting serves to impress one with the fact that in electricity we have a medium of light, which gives far greater opportunity for originality in its use than has any other medium in the history of artificial illumination. One realizes that the incandescent bulb is the first unit of light, not dependent upon a mixture with air in order to produce the proper combustion. All former mediums of light such as candles, oil, and gas have required a constant draught of air. Lacking this, they were snuffed out. Not so with the electric bulb, which is, as a burner, complete in itself, depending for its life and light only upon the steady flow of electric current through its filament. It is therefore possible to place our source of light at any angle and in any part of a room. We can definitely control the direction of our light and atmospheric changes do not interfere with it. We have already a great variety of shapes in electric bulbs, and it is not too much to expect that as we progress, many other ways of enclosing and protecting the filaments will unfold. This being true, it is inevitable that this modern method of lighting will loose itself from the



WROUGHT IRON FLOOR LIGHT



FLAT SHEETS OF THIN ALABASTER, UNIFORM IN SIZE AND SHAPE, USED TO FORM APRONS FOR CONCEALING ELECTRIC BULBS AT CEILING. SIMPLE AND ECONOMICAL IN CONSTRUCTION AND DETAIL



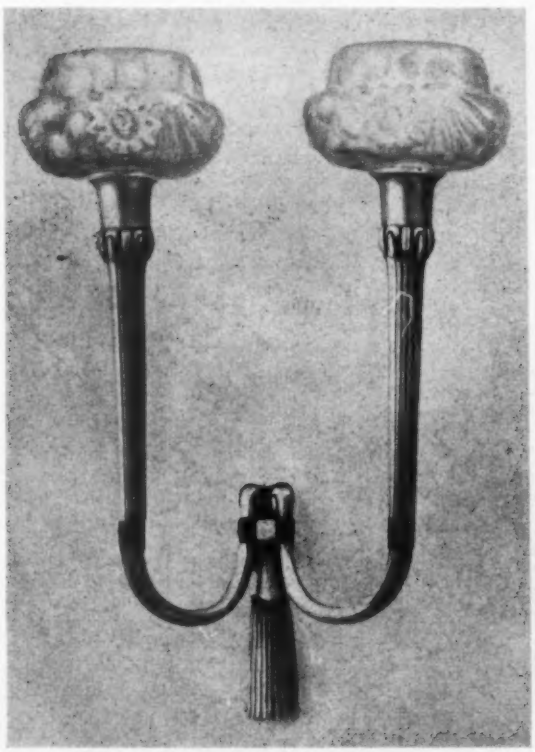
FLAT STRIPS OF GLASS ARRANGED SO THAT THEY OVERLAP, GIVING THE EFFECT OF A MOULDED SHELL WHEN FIXTURE IS LIGHTED. IT IS A WALL LIGHT AND CONCEALS ONE ELECTRIC BULB. THE HOLDER IS OF METAL

mechanics involved in the use of candles, oil, gas, etc., and assume a form distinctly its own. The Paris Exposition should give a strong impulse in this direction.

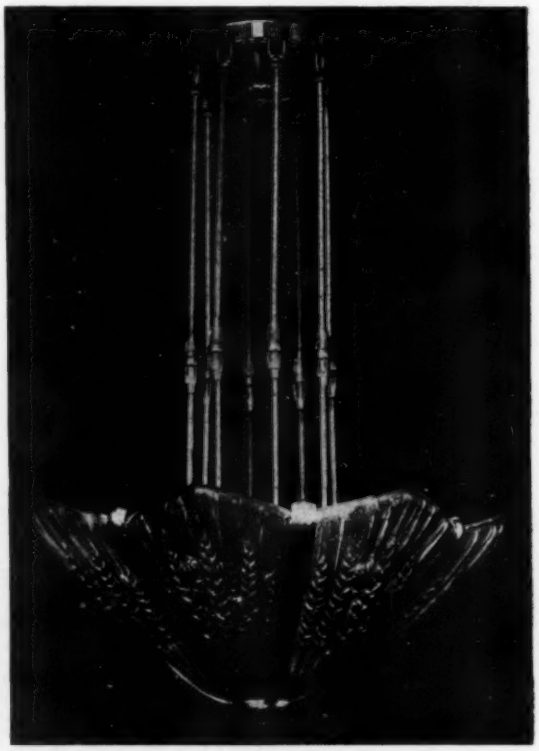
That the artistic results in the present efforts do not measure up in all cases to our standard of beauty is not an essential factor. We must consider the lighting principles involved in forming our conclusions. Greater familiarity with the possibilities presented by the use of electricity will, without doubt, bring greater artistic merit into the work. One thing is certain. Only as we accept electricity as an original factor, demanding original treatment, will we derive the full benefit of its artistic and practical possibilities. In considering the lighting shown at the exposition, it seems but just to acknowledge our debt to those who have blazed the trail thus far.

WROUGHT IRON AND GLASS WALL FIXTURE, BY DOMINIQUE

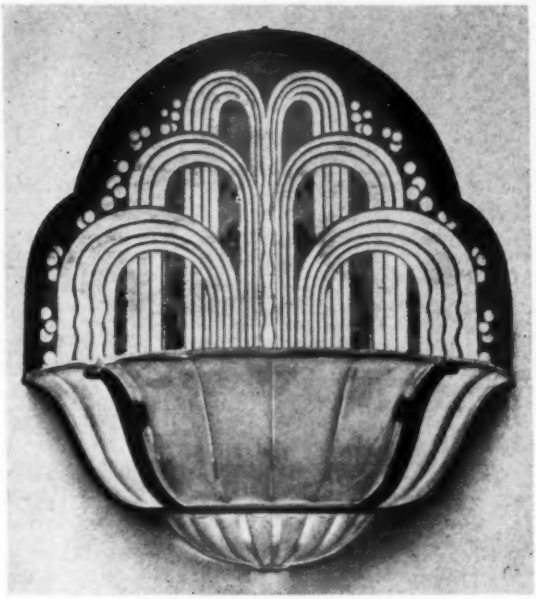
Among the lighting fixtures at the exposition were many arrangements of exposed electric bulbs of low candle power, supported by interesting structures of metal or wood. The light is not shaded in the majority of the cases and its quality, in most instances, had a greater glare than that to which we are accustomed. Much more unusual were the body forms used for enclosing electric bulbs of a higher candle power. Here moulded glass, glass beads, alabaster, silk, shells, etc., were employed very effectively. One was also impressed by the ingenuity with which the designers had repeated sections and forms in building up their fixtures. Flat sheets of alabaster and moulded satin-finished glass have been made into most unusual apron and body forms for concealing electric bulbs. This method of handling made for simplicity and economy in construction. It is also expressive of the manner of the modern decorations in which these fixtures play such an important part. One of the accompanying illustrations will give some idea



BRONZE, SILVER AND GLASS WALL FIXTURE BY GENET & MICHON



A HANGING FIXTURE OF PRESSED GLASS AND BRONZE BY GENET & MICHON



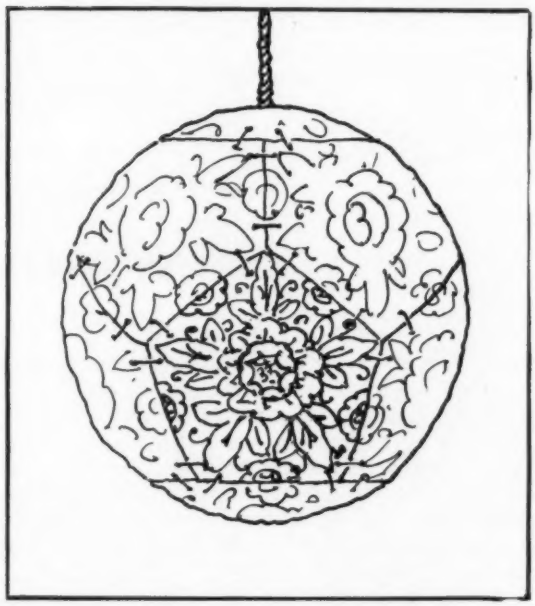
PRESSED AND ENGRAVED GLASS WALL FIXTURE
BY GENET & MICHON

of what has been accomplished along these lines.

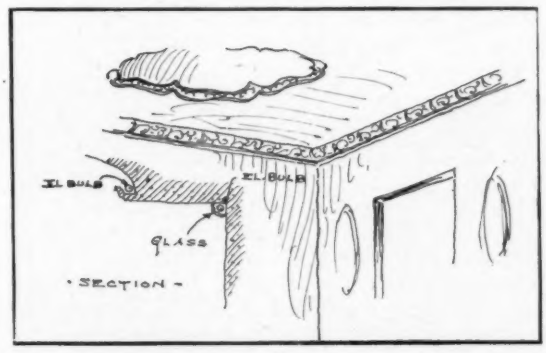
Where moulded glass is employed, it will be realized that great expense is entailed in making the original models and the metal moulds which are necessary for its manufacture. The variety of patterns exhibited, indicated that the French manufacturers were willing to spend freely in their endeavor to show the possibilities of moulded glass. The photograph of the fixture by Genet et Michon shows the quality and effect of this glass. The ball fixture shown in one of our sketches illustrates the commendable ingenuity of its designer. This fixture was made of the moulded glass referred to above and consists of twelve five-sided pieces of glass. These pieces are fastened to each other by wires, thus forming a beautiful ball of decorative glass. In this way the designer has kept the expense of models and moulds down to a minimum and achieved an effect suggesting a far greater expenditure.

Another example of ingenious construction is shown in the sketch of the fan-shaped wall light. Here narrow strips of glass of uniform size and shape were arranged so that they overlapped each other. The double thickness of glass, where it overlaps, gives an impression of a beautifully moulded shell. The economic advantage of this arrangement as compared to moulded glass, should be apparent at once.

The electric wires and sockets used in European countries are considerably smaller than our Amer-



TWELVE SECTIONS OF FIVE SIDED MOULDED SATIN FINISHED GLASS, WIRED TOGETHER MADE A BEAUTIFUL LUMINOUS BALL. A VERY INGENIOUS CONSTRUCTION GIVING AN EXCELLENT RESULT AT A MINIMUM COST FOR MODELS



LIGHTING SCHEME IN A MODERN DINING ROOM AT THE EXPOSITION. CONCEALED LIGHTING IN SUNKEN PLASTER PANEL IN CEILING SUPPLEMENTED BY SUCCESSION OF BULBS PLACED BEHIND MOULDED SATIN FINISHED GLASS SECTIONS, RUN IN AROUND FOUR SIDES OF ROOM

ican fittings. This makes it possible to introduce much more grace into the lines of their fixtures than is usually the case with ours. Several of the pictures herewith illustrate this advantage quite clearly.

A very popular manner of wall lighting is to use half body or pocket forms made of glass, alabaster and other materials. The illustrations of the pieces by Dominique and Genet et Michon show this type of lighting. It was worked out in many interesting and unusual ways at the exposition. Mirrors and series of glass dishes, placed above each other, were also successfully employed.

In many rooms the lighting has been handled primarily as an engineering problem, and the

decorative elements made to conform to the engineering requirements. One room, in particular, interested the writer as an example of this method of lighting. It was a dining room and had been designed with a sunken panel of interesting contour in the ceiling. This sinkage was deep enough to allow the placing of electric bulbs behind an ornamental plaster moulding which formed its frame. The indirect light coming from this source gave beautiful illumination over the table. This was supplemented by a system of diffused lighting in which sections of moulded satin-finished glass were used in a continuous succession around the four sides of the room. A series of electric bulbs were concealed behind the glass. This band of ornamental glass, occurring at the point of intersection between the ceiling and walls, also played a prominent part in the decorative scheme of the room. It was almost equally effective in the daytime when unlit, playing a purely decorative part. We have endeavored to convey the possibilities of this method of lighting in our sketch illustrating it.

A WROUGHT IRON WALL BRACKET

To an American observer, accustomed to the use of electrified candle and oil fixtures of great decorative value and beautiful in execution, many of the lighting fitments in the Paris exposition seemed particularly lacking in beauty of craftsmanship. This may be due to the fact that those behind this movement are endeavoring to express the spirit of engineering, of mechanics and simplicity typical of our age, free from all the splendor and pomp of the Louis'. It seems quite essential to realize this fact in order to grasp the full import of this exposition.

In stressing these factors, there is no thought on the part of the writer that the beautiful decorative objects of the past, which we have employed so successfully in our lighting, and from which we have evolved so many interesting works, will be pushed into oblivion by the modern movement. At the same time we should realize more fully that lighting by means of electricity is essentially an engineering and a mathematical problem. Our decorative features should be built up on this foundation. We should direct our efforts as architects and designers to a fuller realization of the great opportunities at hand in our use of electric lighting. Naturally the start will have to be made in the field of architecture, otherwise our custom of fitting fixtures suggestive of antique periods and earlier mediums of light for electricity, will continue to be the only logical method of illumination.

Probably the most interesting of the lighting effects at the exposition was the manner in which the formal gardens, fountains and pools were illuminated. Advantage has been taken of the opportunities offered by shrubs, flower boxes and the basins of pools for concealing electric bulbs of various colors. Many beautiful and unusual effects were obtained in this manner, and one had an excellent opportunity for judging the possibilities still to be achieved in this direction.

To the writer, it became evident that the day is not far distant when the beauty of our gardens, fountains and pools will be enjoyed as fully by night as by day through availing ourselves of this wonderful modern medium of illumination — ELECTRICITY.

A NEW HOTEL IN PARIS

A PROJECT is on foot for the erection of what will be the largest hotel in the world in Paris, states *The Architect,* London. The scheme is backed by a number of wealthy Chicago men, who propose to spend no less than four million pounds on its erection. Among the features contemplated and included in the scheme are a department for the purchase of dresses for those who are in haste and presumably can pay! a tropical roof garden, a skating rink and a swimming pool. The idea is an interesting one, but we expect that the suggestions here made will prove to be a little on the large size and that the scheme when it takes concrete form will be somewhat diminished in scale.

EDITORIAL COMMENT

ARCHITECTS ARE NOT selling architecture as much as many of them claim. Architecture sells itself. It is professional service that architects offer their clients, a demonstrated ability to take the rigid problem of the building, design it to meet every utilitarian need and clothe it in the best architectural expression of which the architect is capable. But, first of all service.

The lamentations that are constantly received by the editors of this journal from subscribers who bewail the fact that there is a growing tendency to eliminate architectural services from the moderate cost buildings, are recitals of a condition largely created by architects themselves. They have failed to impress the public with the fact that the value of their co-operation does not solely lie in the design and plan, but in the service they give, in the close attention to details and the proper selection of materials. As in the case of the manufacturer, the architect with the best organization (a practical ability to serve) will become the most successful.

If architects, and especially those who practice in smaller communities, lazily let their contractors supply the service that they rightfully should give, they have none but themselves to blame that builders are usurping their functions and quietly adding to the contract price a certain amount for service which they are compelled to give in order to provide for the lack of architectural service.

This matter of service appears constantly in everything we confront. If any man hopes to meet and overcome competition successfully, no matter whether he is the youngest draftsman in the office or the "boss" himself, in every grade there must be service. And the more thorough, the more competent it is the better are the chances for survival in an age when competition is keener than it has ever been before.

* * *

THAT BUSINESS IN THE United States, principally because of the phenomenal development of national advertising, and the increased facilities of communication and transportation, is in process of a transformation which is so radically changing the trade structure as to be nothing short of a "commercial revolution," is the view expressed by the National Industrial Conference Board in a recent analysis of trade conditions.

The concomitant evolution of new business methods and tactics presents problems to which public policy is slowly adapting itself. Two factors stand out as significant in the changing picture of business evolution. The waning importance of the personal factor in trade, and the shortening of the process of distribution. Where formerly goods were bought on inspection and by personal bargaining, nationwide advertising has made possible the more direct purchasing, by specification, of standardized commodities at given prices without intermediaries. The manufacturer, brought nearer to his markets through nationwide advertising, is gradually depending less on salesmen or jobbers, and prompt deliveries by improved freight service and the auto truck make possible frequent ordering in smaller quantities.

The resulting quicker turnover on a larger scale has released much capital that formerly has been tied up. But the new ways of doing business also have brought many new problems of readjustment and of regulation, toward the solution of which the Federal Trade Commission's activity is directed.

Among the novel business tactics developed under the new trade conditions are many not easily classified as fair or unfair, and some not wrong in themselves, yet undesirable for economic reasons. As advertising takes the place of personal contact between buyer and seller, the report points out, the producer is forced to adopt new devices to develop and retain good-will so as to assure himself of a steady volume of business. Branding of products, intensive advertising of trademarks and trade names and of retail prices, and attempts to enforce such advertised prices thus developed, are the efforts to capture and hold distant markets. In working out the problems of regulation arising from these newer methods of selling, and in the sifting of the "unfair" and the fraudulent from the legitimate, much co-operation is being given the Federal Trade Commission by trade associations and voluntary business organizations.

While there are big problems arising from the radical change in conditions which eventually must be solved through judicial procedure, self-regulation is emphasized as the most effective means of trade discipline, and as the one positive hope for the further development of business enterprise along the lines of free competition.

Government policy, the Conference Board finds in analyzing administrative and judicial procedure under the Sherman anti-trust act, the Clayton and the Federal Trade Commission acts, is slowly adapting itself to the changing conditions, and "big business" no longer is regarded with suspicion simply because it is big. This change in attitude is warranted by the experience in government regulation under the Clayton and Federal Trade Commission legislation during the ten years of the Commission's existence.

THE CROSSING AND NORTH TRANSEPT OF THE WASHINGTON, D. C., CATHEDRAL

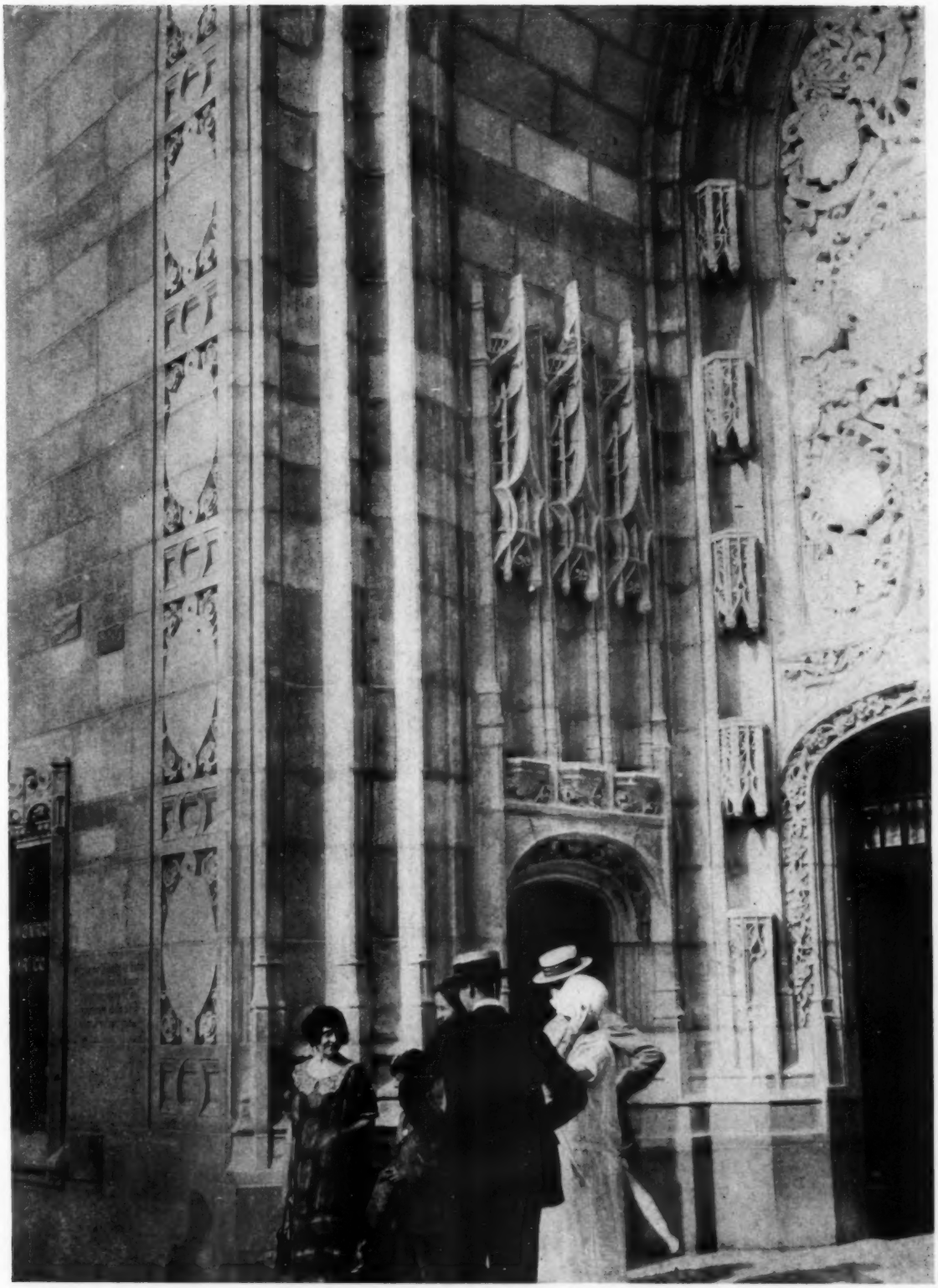
FROM THE ORIGINAL DRAWING FROM THE OFFICE OF FROHMAN, ROBB & LITTLE, ARCHITECTS

"THE TRIBUNE" BUILDING, CHICAGO, ILL.

JOHN MEAD HOWELLS AND RAYMOND M. HOOD, ASSOCIATED ARCHITECTS

"THE TRIBUNE" BUILDING, CHICAGO, ILL.

JOHN MEAD HOWELLS AND RAYMOND M. HOOD, ASSOCIATED ARCHITECTS



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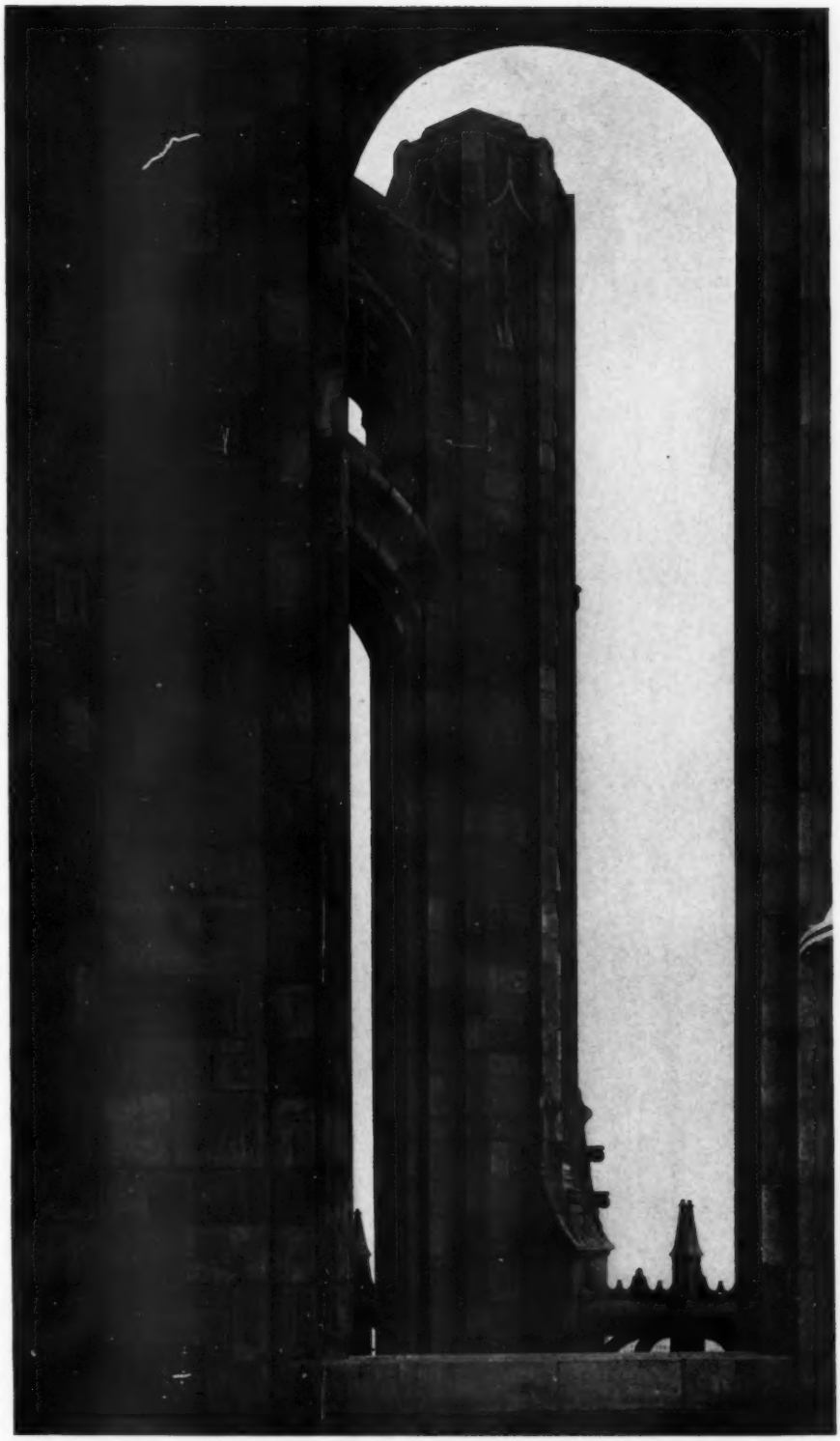

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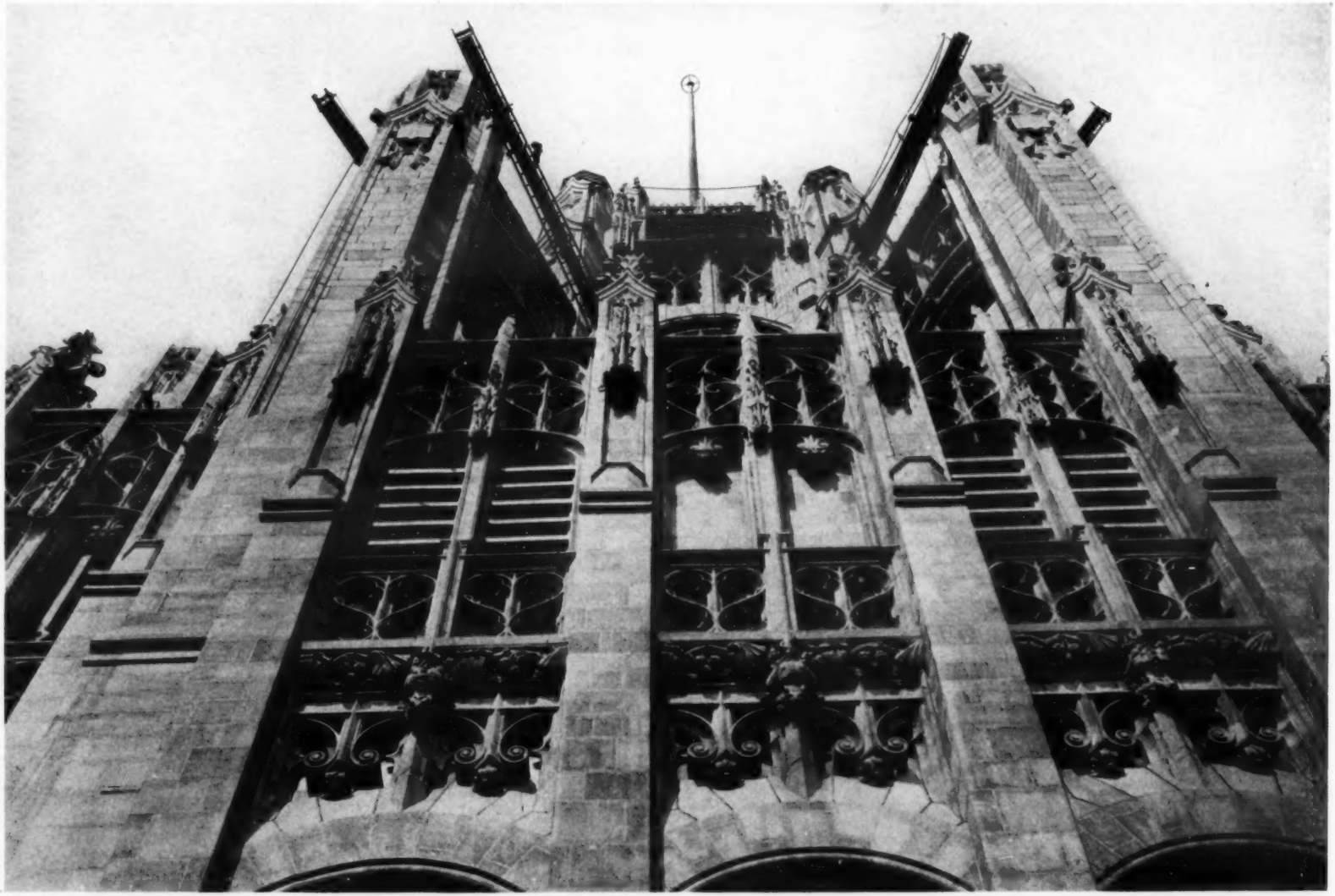

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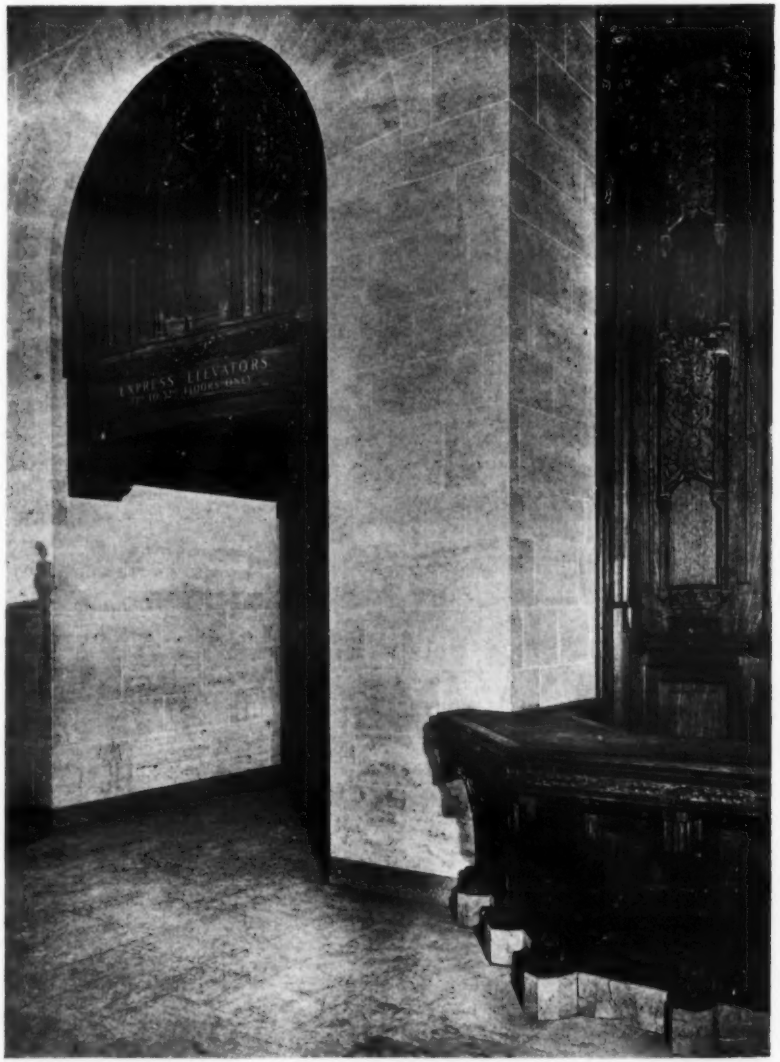

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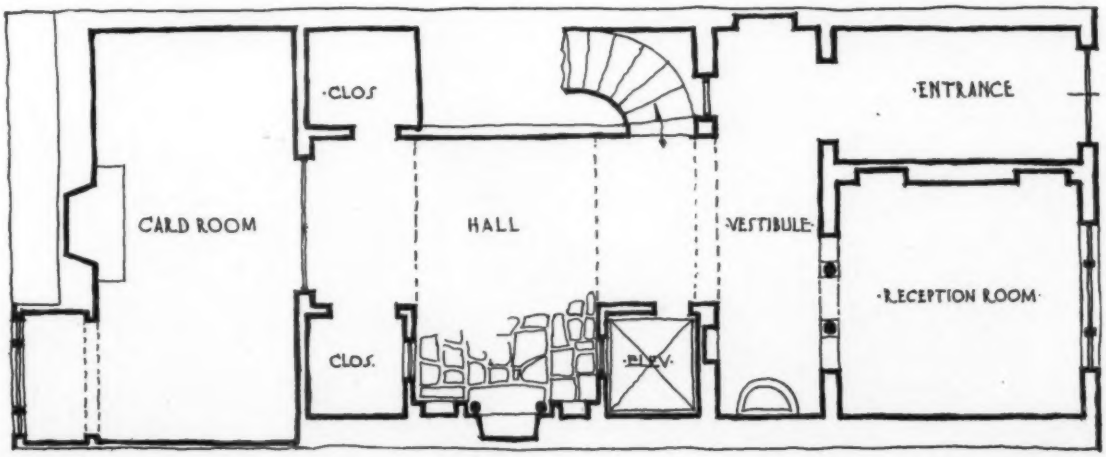
INTERIOR ARCHITECTURE

The Periods Given New Interpretation

THE ideas which characterized the designers of interior architecture of various contemporary periods of Europe during the fifteenth and sixteenth centuries served as the inspiration for the design of the rooms of a modern town house recently decorated by P. W. French & Company of New York. Several photographs of adjoining rooms on the first floor are illustrated herewith. In certain respects, for example, noticeably in the arched recesses and supporting brackets on the walls in the reception room, the designs recall the old Italian; in the columnar treatment at the opening between the reception room and the vestibule, the spirit of the Spanish is evident, while in many of the details of the design of the card room, the scheme is reminiscent of the early Tudor of England. The resulting designs are in no way intended to be authentic in period interpretation. They represent, however, the present vogue in modern American interior architectural design, which might be best described, perhaps, as a combination of ideas of various periods of European art, reincarnated to meet modern demands and requirements and made harmonious, one to another,

LEAD AND BRASS FOUNTAIN IN THE VESTIBULE

P. W. FRENCH & COMPANY, DECORATORS



FLOOR PLAN OF A CITY HOUSE, SHOWING ARRANGEMENT OF THE SEVERAL ROOMS ILLUSTRATED IN THIS ARTICLE

P. W. FRENCH & COMPANY, DECORATORS

in their new interpretation. Contemporary periods offer the best opportunities for such application, in that there is ever visible throughout the designs of contemporary styles a similarity of purpose by which they become unified, although their manner of expression may be strikingly contrasted. Throughout the designs of all the periods of the late fifteenth and early sixteenth centuries, for example, including the Italian, Spanish and English styles, there was a common tendency toward austerity, simplicity and sincerity, in the expression of which there are discernible a crudeness and free-hand quality which give to all the designs of that era a personality that is interesting as well as characteristic and distinctive.

IN THE VESTIBULE, LOOKING TOWARD THE RECEPTION ROOM, SHOWING INTERESTING COLUMNAR OPENING

The principal drawback to this idea of combining motifs and forms of various periods into one decorative scheme is that there is not apt to be one central point of interest in the room or interior. The principle of subordination in design is often completely overlooked. Each of the periods had certain distinctive

IN THE RECEPTION ROOM, LOOKING INTO THE VESTIBULE

peculiarities which gave it character and personality, and, by introducing these features in the same scheme in competition with one another, the result is sometimes sadly jeopardized. In connection with the designs of the several rooms in the particular house herewith illustrated, it must be said that this handicap has been well nigh overcome.

CARD ROOM, SHOWING CARVED WOOD GATES LEADING TO THE HALL

P. W. FRENCH & COMPANY, DECORATORS

The characteristics of some one especial period predominate to such an extent in the design of each room that motifs, suggested by other periods, introduced, do not seriously detract from the main purpose and interest. Being derived from contemporary styles, too, their characteristics are often very similar, and thus is harmony more surely attained.

A VIEW IN THE HALL LOOKING TOWARD THE CARD ROOM BEYOND

Featured in the schemes of the various rooms are the rough textured plaster walls, similarly treated ceilings, divided into panels by handhewn oak beams, stone wainscot and mantels, oak wall panelling, and marble and tile floors, all more or less characteristic of the several contemporary periods by which the designs were inspired. The overmantel decoration in the card room, as in the hall, consists of a handsome piece of tapestry encased in a frame of carved wood appropriate in character to the dominating tendency of the decorative scheme. A pair of carved wood gates is hung at the opening between the hall and the card room in the design of which Gothic motifs are evident. Attention might also be directed to the treatment at the opening to the window alcove in the card room, to the left of the mantel, in which heavy oak timbers make the form of an arch. The lighting fixtures throughout are suggestive of the period whose influence seems to dominate the particular scheme of which they are a part, although, in the card room on either side of the mantel, are wall brackets in the design of which Gothic motifs have been cleverly adapted.

Genuine antique furniture is used throughout, carefully selected to fill the space allotted to it. Emphasis on one particular period in each room is brought about probably more by the style and character of the furniture than by any other elements of the architectural or decorative schemes. In the reception room, for example, the more important pieces of furniture are of Italian design, although an occasional Spanish and English piece is introduced to effect a closer harmony between this and adjoining rooms. In this way, the Italian features of the architectural treatment,—the recessed arches, wood beams, and wrought iron fixtures—are accentuated, as is, for example, the wainscot—suggestive in detail of Jacobean times, —in the card room, in which furniture of the English style predominates. The hall is somewhat more nondescript in style, for early Tudor, even pure Gothic, Italian, and Spanish details have been intermingled.

THE CARD ROOM SHOWING FIREPLACE AND BAY WINDOW ALCOVE

P. W. FRENCH & COMPANY, DECORATORS

The NEW EMBASSY THEATRE, NEW YORK CITY

THOMAS W. LAMB, Architect

RAMBUSCH DECORATING COMPANY, Decorators

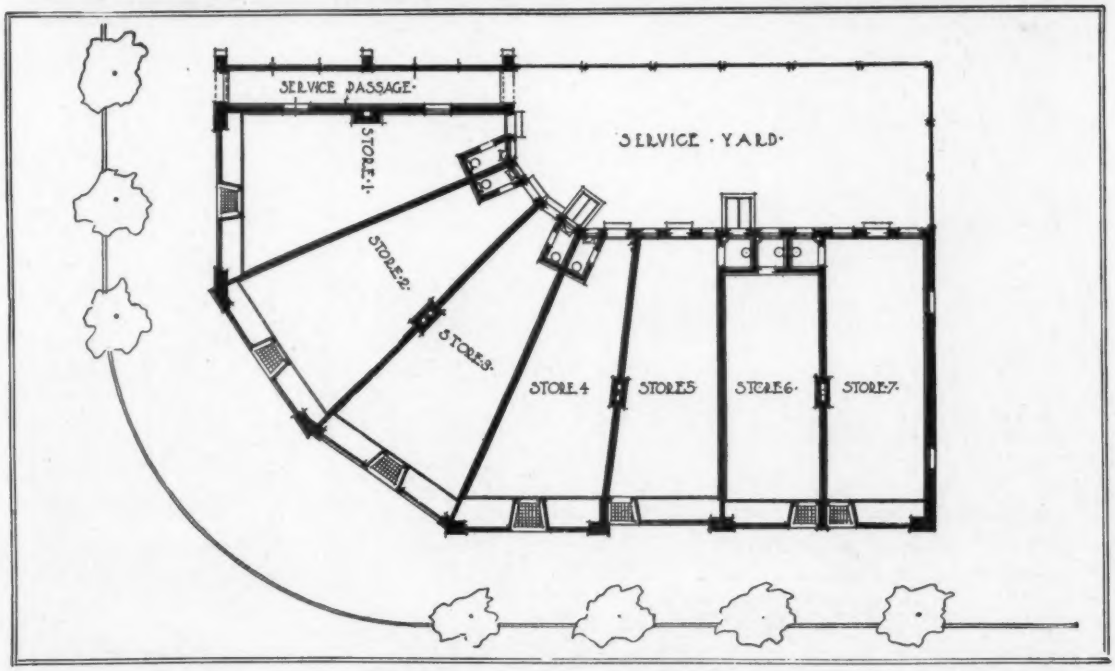
AN "intimate theatre" best describes Broadway's newest motion picture house, the Embassy, which was opened to the public about six weeks ago. This theatre was installed in the space in a new building that was originally allotted to a men's furnishing establishment without rearranging the floor plan in any way whatever, neither raising the ceiling nor lowering the floor. The seating capacity of the entire house is something under six hundred, for without balcony or boxes, the seats are all on one floor. Nor is there a stage. The decorative scheme, both in design and color, finds its motif in the Louis XIV and is reminiscent of the Salons of France in the hey-days of the Louis Kings.

THE LOBBY, IN CREAM AND GOLD

ONE OF A SERIES OF MURALS BY ARTHUR CRISP, AFTER THE STYLE OF WATTEAU, FEATURED IN THE SCHEME OF THE AUDITORIUM. THE DECORATIONS RECALL THE SCHEME IN THE WATTEAU ROOM IN THE CHATEAU DE BRUSCHAL

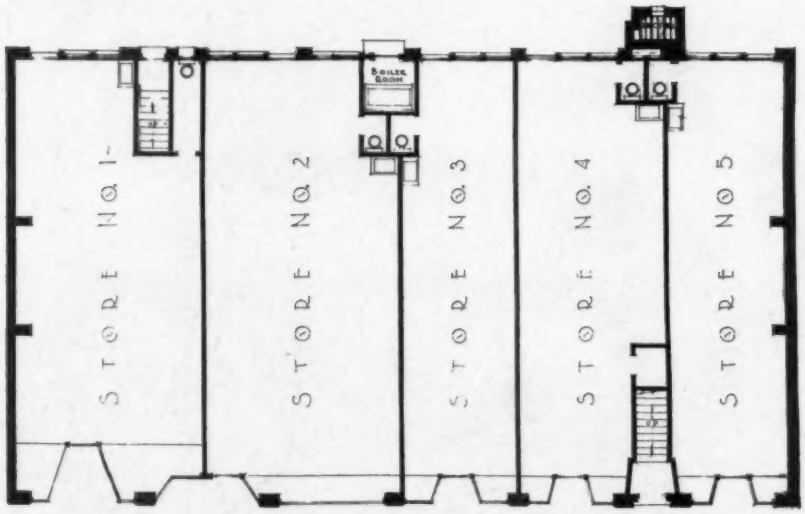
THE COLOR SCHEME OF THE WALL ORNAMENTATION IS ACCENTED BY RED LACQUER AND BLACK MARBLE, AND THE CEILING IS DONE IN COOL GRAY AND GILT

THE FOYER IS CARRIED OUT IN CIRCASSIAN WALNUT AND GOLD, AND FEATURES AN ELABORATE CRYSTAL CHANDELIER AND HANDSOME FURNITURE OF THE PERIOD



VILLAGE STORE GROUP, WATCHUNG, (MONTCLAIR), N. J.

CLIFFORD C. WENDEHACK, ARCHITECT



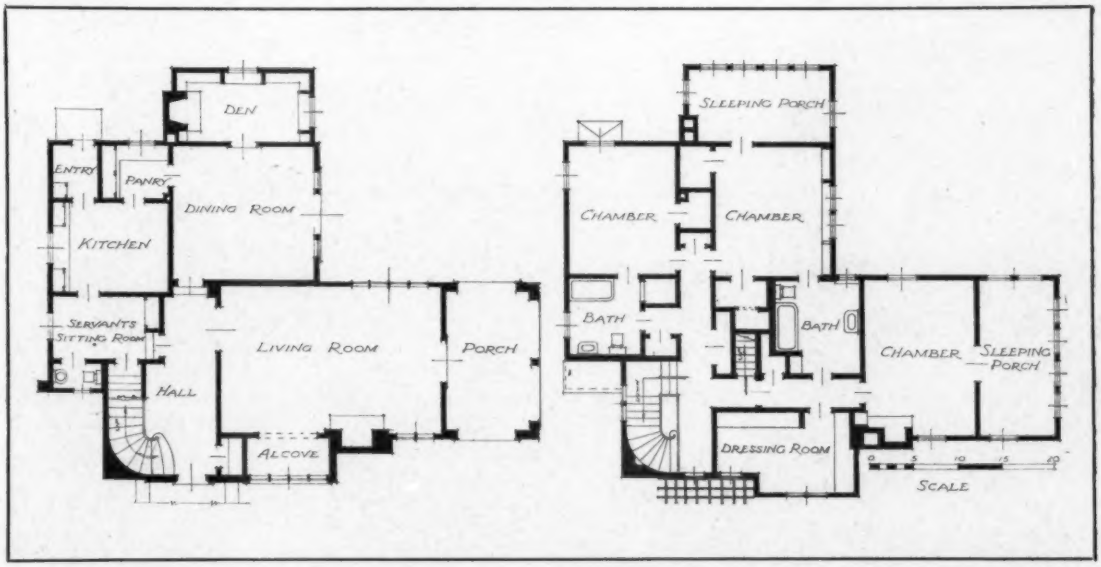
BRICK walls with reinforced concrete horizontal ties under the second floor joists and second floor ceiling. Flooring of oak; partitions of wood stud and plaster; roofing, composition; trim, Oregon pine. Heated by gas furnaces. Built in 1923 at a cost of 28½¢ per cubic foot.

STORE AND APARTMENT BUILDING, LOS ANGELES, CALIF.

WITMER & WATSON, ARCHITECTS

HOUSE OF DR. H. P. KUHN, MISSION HILLS, KANSAS CITY, MO.

CLARENCE E. SHEPARD, ARCHITECT

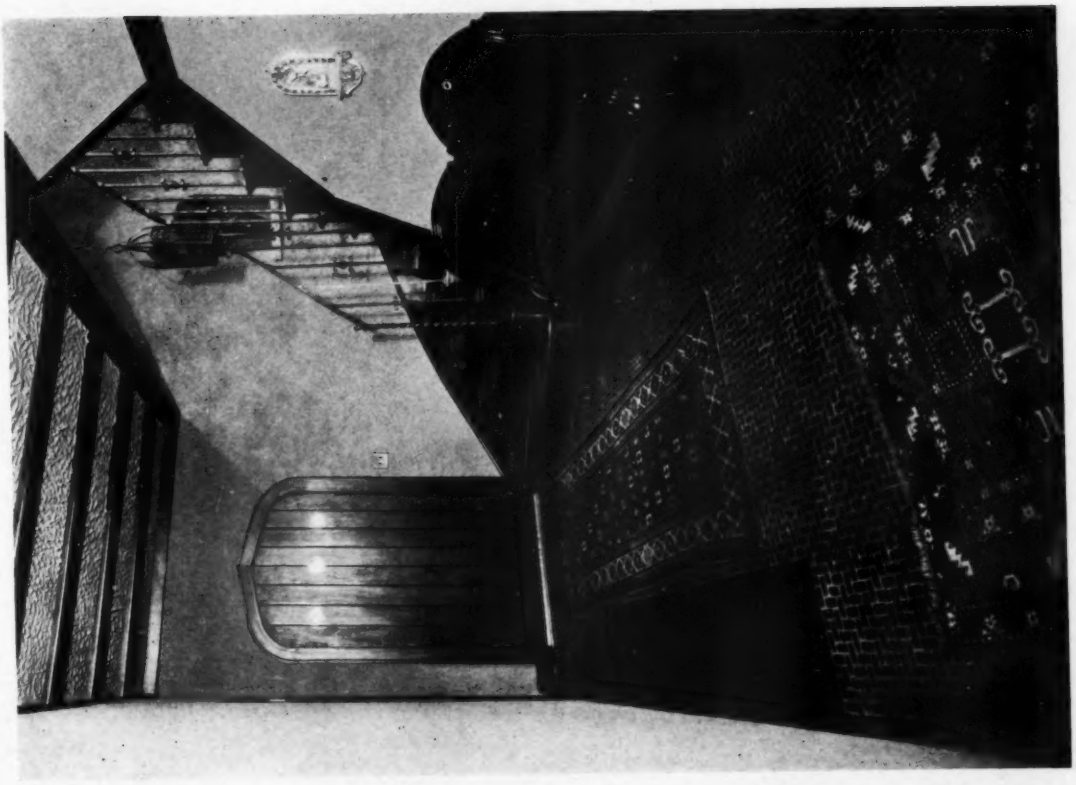


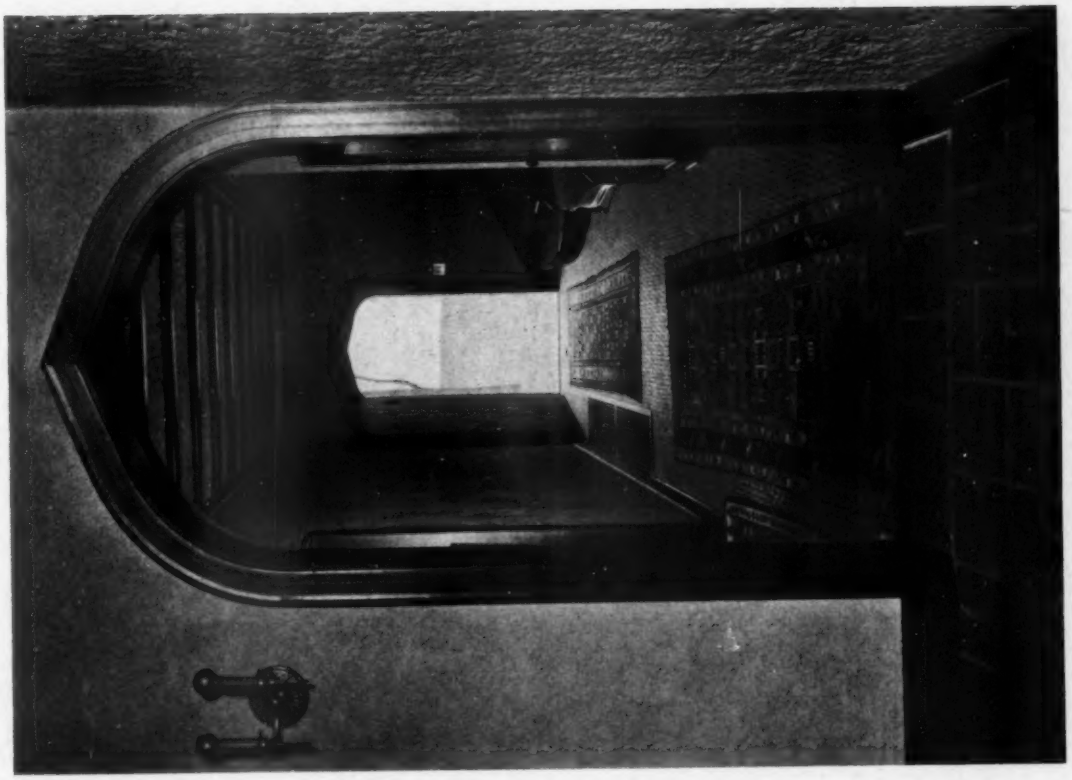
HOUSE OF DR. H. P. KUHN, MISSION HILLS, KANSAS CITY, MO.

CLARENCE E. SHEPARD, ARCHITECT

THIS house provides an interesting example of well handled application of different materials. The lower part of the exterior is a combination of stone, rubble and brick; the upper stories of brick veneer. Roof is wood shingled. The interior partitions are wood lath on wood studs and the wall surfaces are finished in hard white plaster. The floors are of wood construction, in some instances covered with linoleum. The bathrooms have tile floors and the lower hall is covered with herringbone "biscuit" heather tile. The exterior color scheme is buff stucco, heavy dash, chestnut brown trim, with burnt orange shutters. The house is heated by an oil burning, hot water heater, and the plumbing and electric light fixtures are of standard equipment. Cubic cost not available.

Many a well designed suburban house is disfigured by awnings. Even if their color harmonizes with the exterior color scheme, their introduction mars the general effect of well balanced structural lines. It is a difficult problem to provide structural awnings, as their presence is only required during the Summer months, and in Winter the bright sunlight should freely enter the rooms. Where the climate, as on the Pacific Coast, is more equable, this matter of structural awnings has been well solved. In the middle West and East, it is one that has not as yet been successfully met.





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CLARENCE E. SHEPARD, ARCHITECT

HOUSE OF J. W. HELM, SUNSET HILL DISTRICT, KANSAS CITY, MO.

CLARENCE E. SHEPARD, ARCHITECT

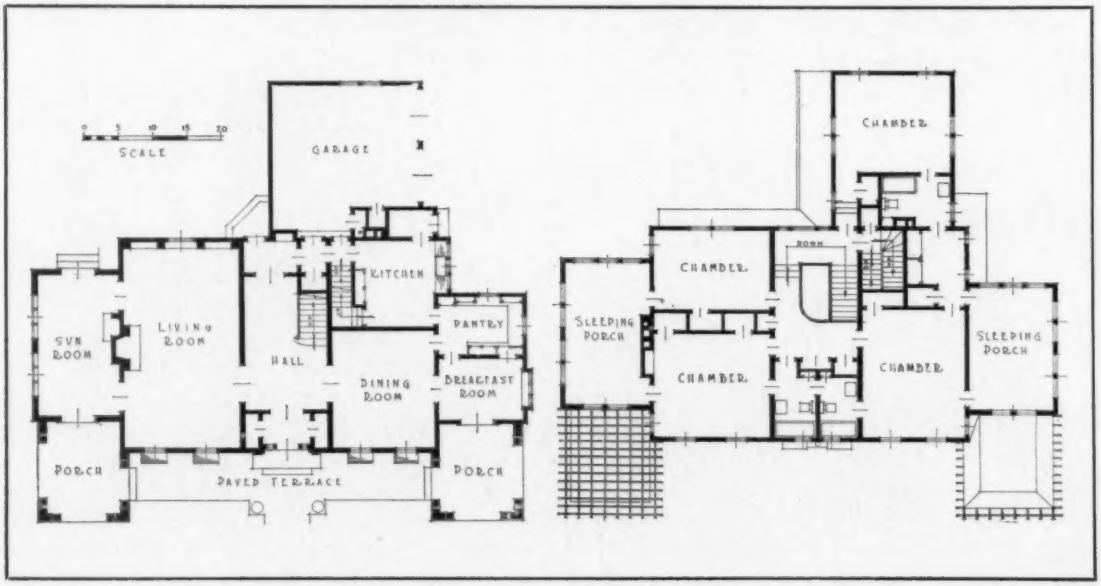
THIS house, located in a restricted residential section of Kansas City, is typical of a style that has been well developed in that locality. Its comparatively recent erection has not given time for the development of a well considered planting scheme that will eventually provide the seclusion that it was the intention of the architect to effect.

The house is of frame construction with exterior walls of stucco on metal lath. Roof is wood shingled. Roof flashing, leaders, etc., of galvanized iron. Doors and windows are of wood. Exterior color scheme, light cream with ivory white trim. Roof, gray-green. Heating is by an oil burning, hot water heater. Partitions are wood stud and lath. Walls are plaster, hard white finish. Floors and trim are of wood, with tiled sun room and bathrooms. Interior woodwork finished in old ivory enamel. The central hall is flanked by the large living room the full depth of the house, with dining room, breakfast room and kitchen on opposite side. The second floor provides four bed chambers with two sleeping porches. There are three bathrooms on this floor. Third floor is planned for servant quarters and additional rooms. Cubic cost not available.

Color in the country and suburban house is a matter that has not been as carefully considered as it should be. In this house the scheme of color is particularly well chosen to supplement the style of architecture that dominates the design, and cause it to rest quietly and pleasantly with its surroundings. Suburban architecture in this country is now in the stage of its best development. The one thing needed to bring it to a better result is the introduction of well considered color schemes.

HOUSE OF J. W. HELM, SUNSET HILL DISTRICT, KANSAS CITY, MO.

CLARENCE E. SHEPARD, ARCHITECT



THE EVANSTON, ILLINOIS, TOWNSHIP HIGH SCHOOL

PERKINS, FELLOWS & HAMILTON, ARCHITECTS

THE site has a frontage of 1495 ft. on Dodge Avenue, the eastern front, and 1620 ft. on Church and Lake Streets, the north and south boundaries. The west line is within a short distance of the west boundary of the city. For the purpose of providing switchtrack service an additional lot was purchased on the south side of Lake Street opposite the southeast corner of the school grounds and upon the Mayfair cutoff of the Chicago and Northwestern Railway. Upon this the boiler house has been erected, and has been connected by a subway with the main building.

Only the academic section and a gymnasium for boys could be built with the funds available. Nevertheless, a comprehensive plan was evolved and has governed the construction up to the present time. A "T" plan was chosen for the academic section for superiority in control of corridors and class rooms and study halls have been built having east or west light. The various laboratories and drawing rooms have been given north and south exposures in conformity with their requirements, and space for future wings of similar character has been reserved for future class room additions.

In accordance both with law and with best practice, exits, stairs and toilets have been well distributed throughout the various sections of the building, toilets being located on each floor and exits at the bottom of every stairway. The buildings are entirely of fireproof construction and all windows are of steel.

The present attendance is approximately 1700 pupils and 3000 must be provided for within ten years.

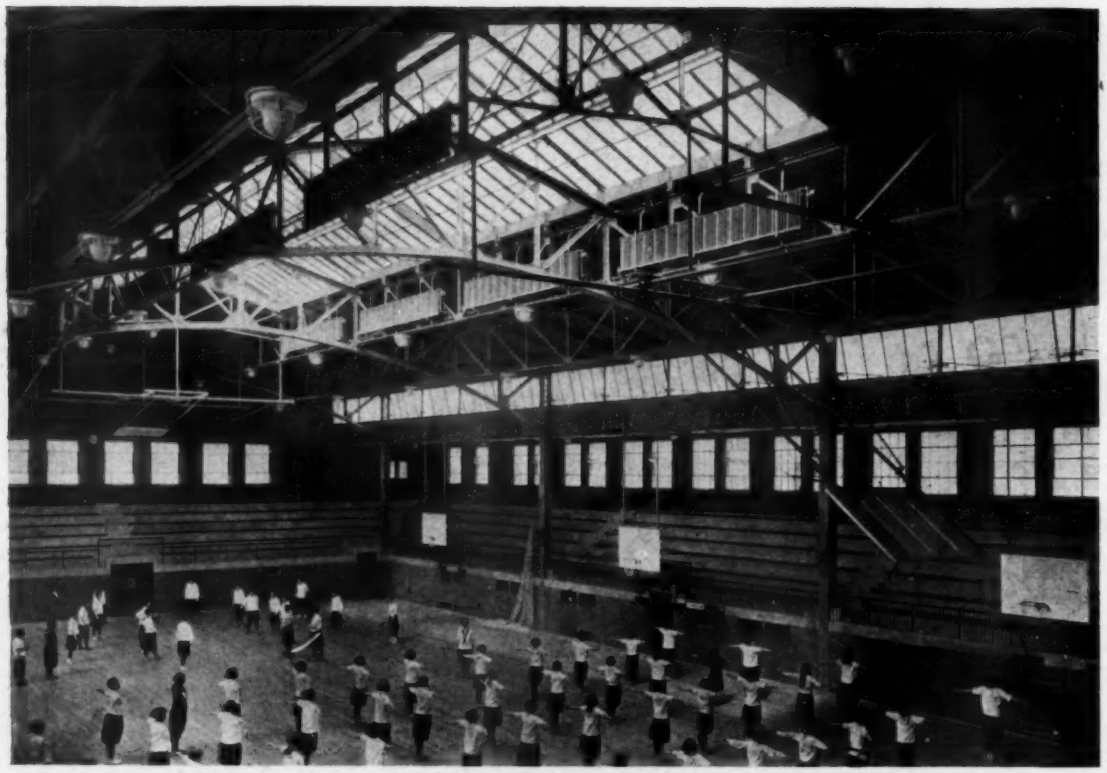
The administrative offices are between the two tower entrances on the first floor. They include a large public room, a spacious office for the principal, large enough for the board meetings, and vaults, storage rooms and recorders' offices as well. Above these offices extending through two stories is located the library. This is a central book room and is related in management to the auxiliary book service stations in the study halls. Above the library is located the music department, consisting of a large recital hall with two small and two large class rooms.

In each story of both the north and south wings one finds the large study halls, six in all, each seating 250 students, or a total of 1500 students. These are only filled for the first fifteen minutes of the day; after that parts of the student body go to the class rooms adjacent or on the central corridor, leaving a smaller number there to study.

The gymnasium is planned for boys, but is used for the present by both girls and boys. The playing floor is 72 ft. x 120 ft. and may be used as one court for exhibition games, or it may be sub-divided by netting into three courts, each 72 ft. x 40 ft. and used by three sets of players at one time. The lockers, showers and toilets are built beneath the concrete spectators' galleries. The academic building cost, $1,156,000.00; the gymnasium, $313,300.00; and the power house, $287,700.00, making a total cost of $1,757,000. Cubic cost 37.1¢.

THE POWER HOUSE

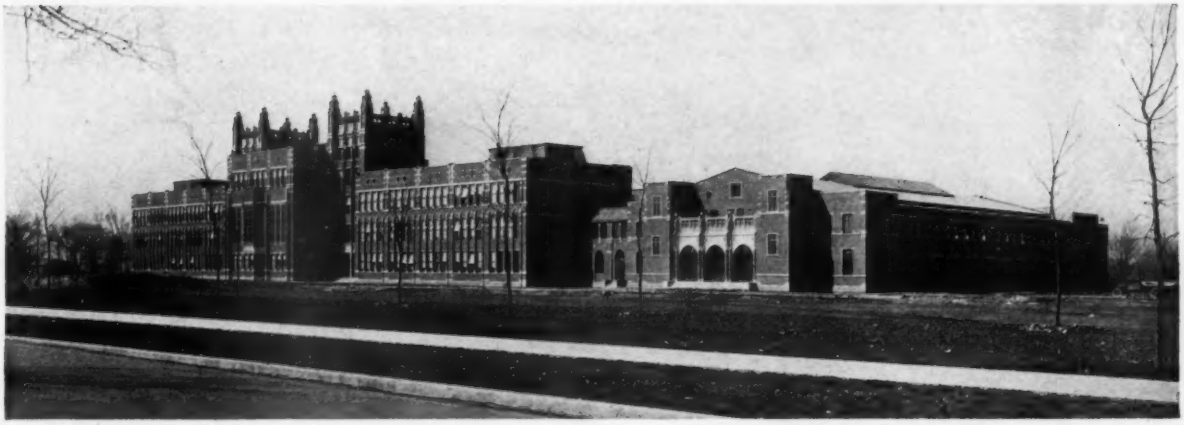
STUDY HALL

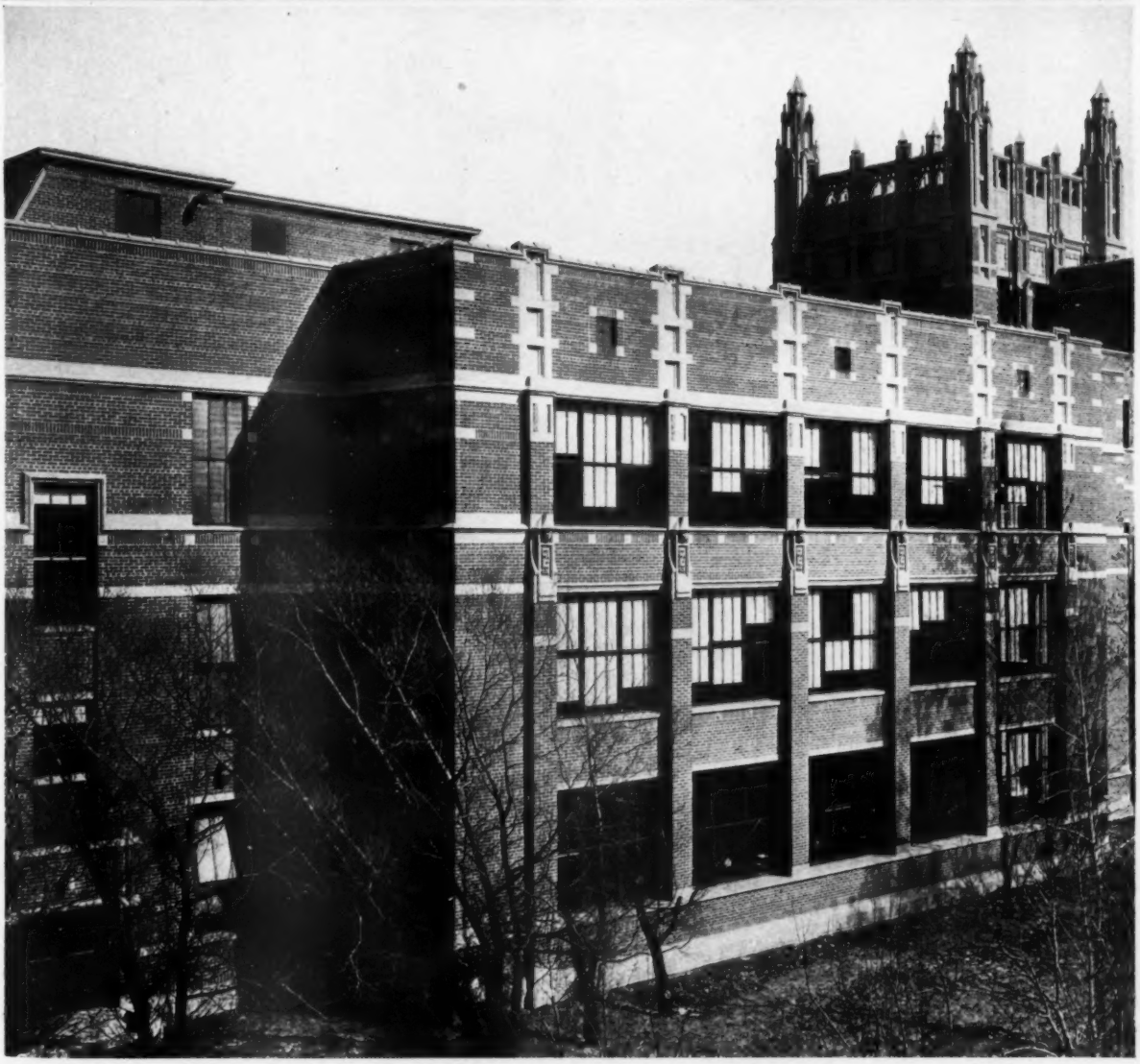


GYMNASIUM

THE EVANSTON, ILLINOIS, TOWNSHIP HIGH SCHOOL

PERKINS, FELLOWS & HAMILTON, ARCHITECTS

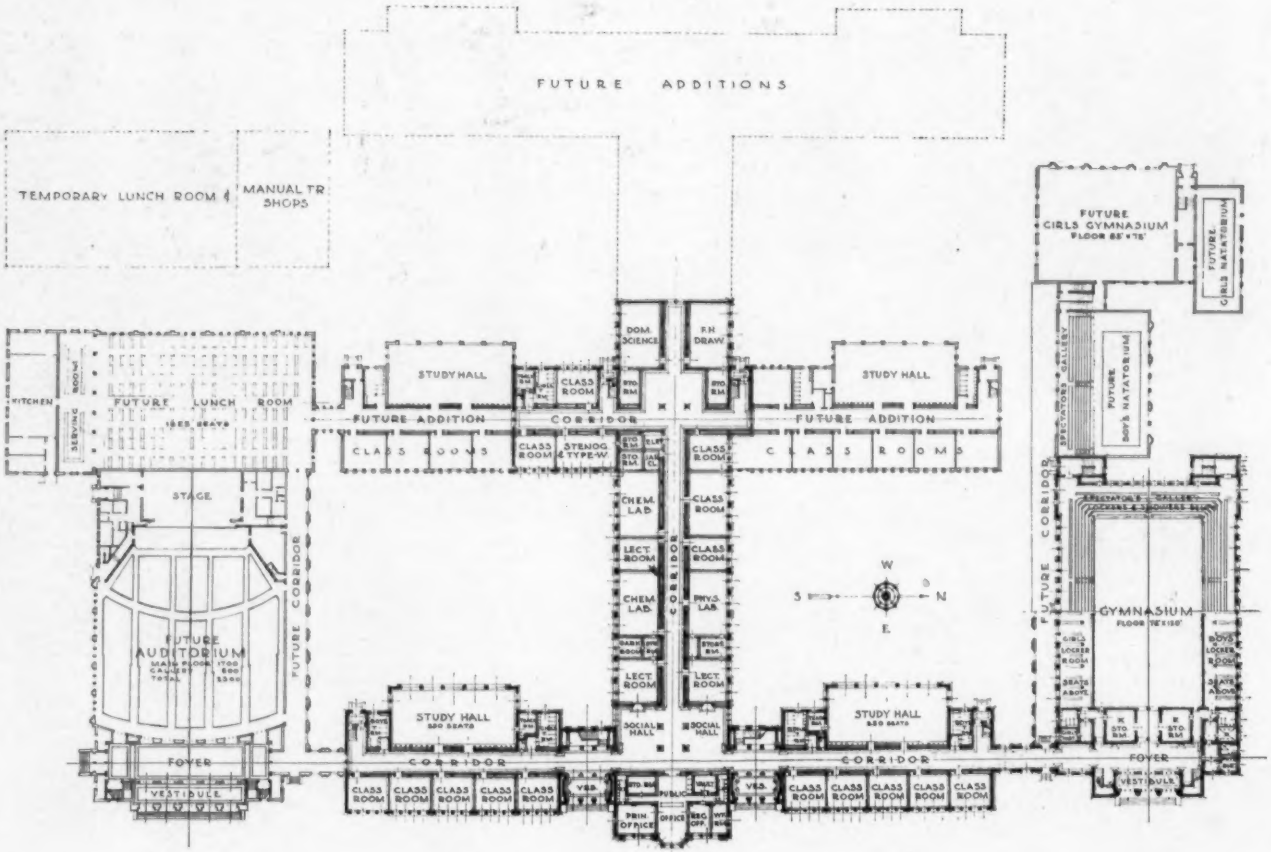




THE EVANSTON, ILLINOIS, TOWNSHIP HIGH SCHOOL

PERKINS, FELLOWS & HAMILTON, ARCHITECTS

(See plan on back)



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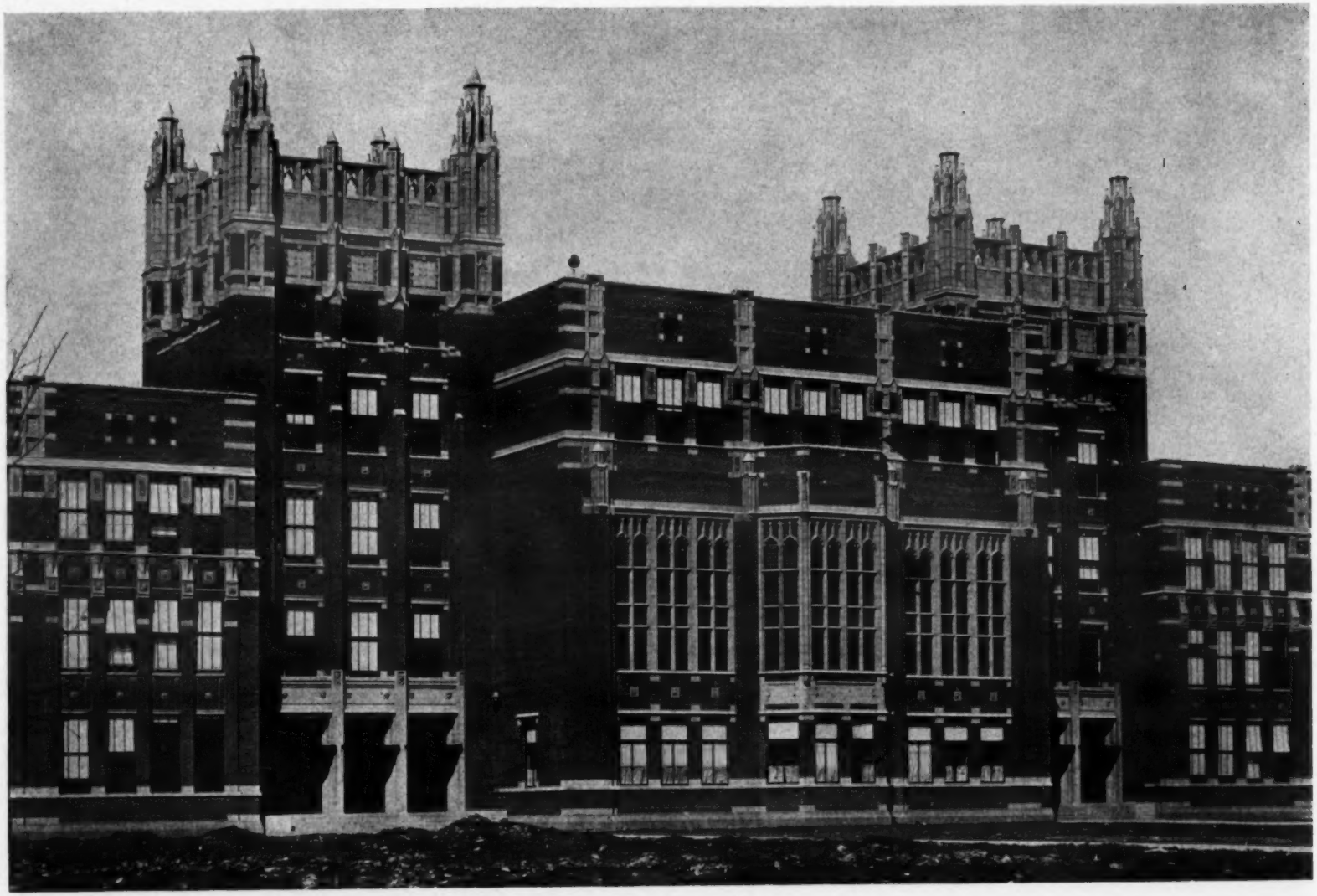

THE EVANSTON, ILLINOIS, TOWNSHIP HIGH SCHOOL

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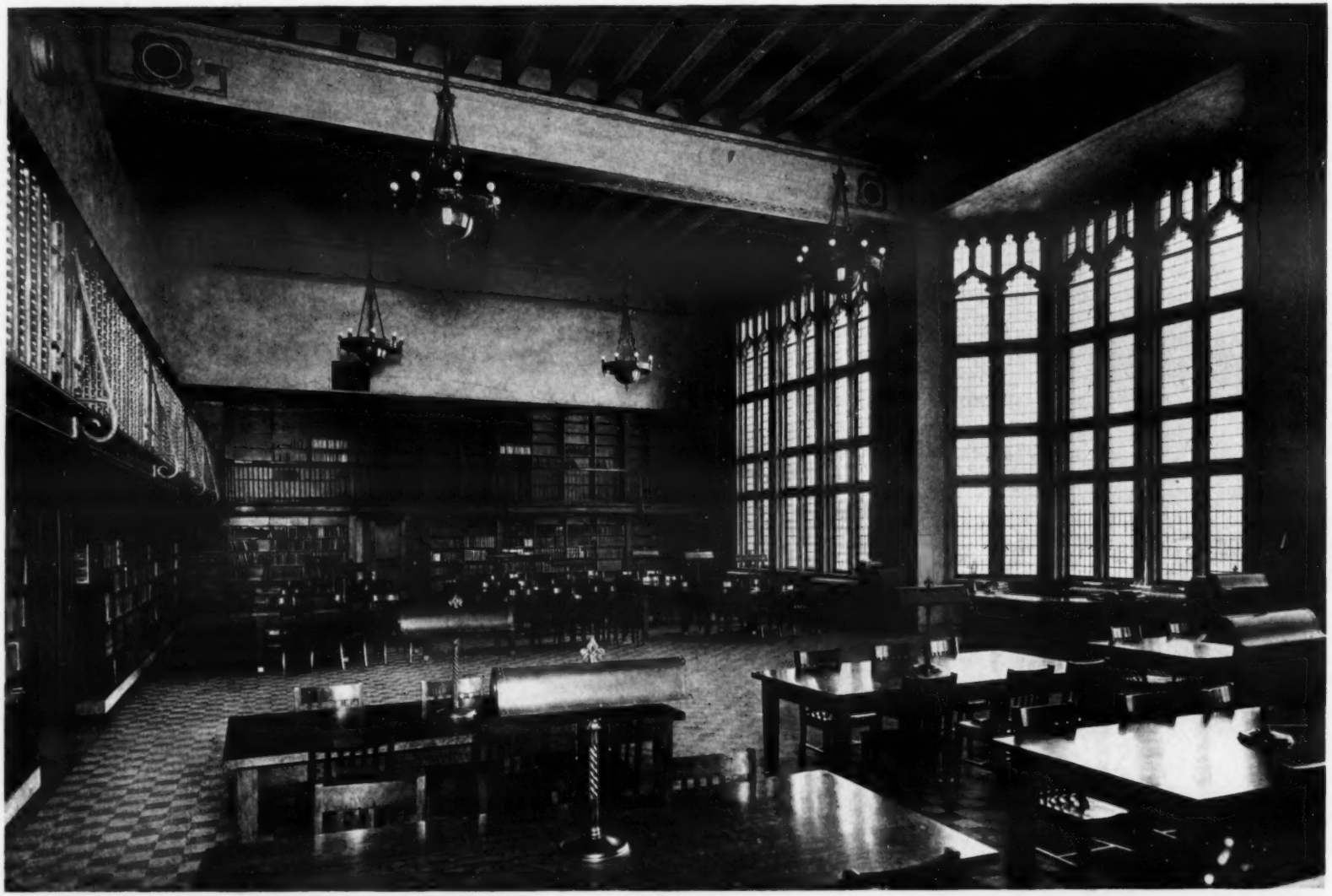

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THE EVANSTON, ILLINOIS, TOWNSHIP HIGH SCHOOL

PERKINS, FELLOWS & HAMILTON, ARCHITECTS

A DOORWAY IN SEVILLE

DETAILS OF SPANISH ARCHITECTURE

The CHOICE *of an* ARCHITECT

BY C. H. BLACKALL, F. A. I. A.

A GREAT deal has been said and written regarding the extreme desirability of choice on the part of the client when it comes to selecting an architect. There is one consideration, however, of which we hear very little. There are, we will say, 5,000 or 6,000 architects in this country. Very few of these architects do any more than a slight proportion of their own work, and most of the actual drawing and a great deal of the designing is done by employees, or associates, so that against the body of 5,000 or 6,000 architects, there are presumably 20,000 or 30,000 draftsmen, all of whom are in the market. The time was not very long ago when every draftsman was supposed to be a potential architect, and it is still the custom to consider that the draftsmen will ultimately develop into architects with offices of their own, but as a matter of fact there has developed a very considerable stability of occupation, the great majority of draftsmen not being likely ever to become architects but will continue in the subordinate position throughout their lives. From this condition has arisen another, that opportunities for growth and development in the profession do not seem to weigh as much with many draftsmen as they did in a period not very remote, and the amount of money compensation which a draftsman receives each week in many cases outweighs any thought of architectural benefits which might accrue to him from association with a man of ability and talent. Also the field of architecture has been invaded to a very considerable extent by corporations, more or less engineering in their nature, who have established architectural departments as a part of their work and administer such departments wholly on a business basis, paying prices for draftsmen's services which are higher than architects can pay, and establishing standards which are not always such as the profession would wish to admit. The fact that the engineers and the corporations very frequently charge up all their expenses to their clients, adding a fee for themselves, not necessarily a percentage, makes it very easy for them to pay very high prices for draftsmen, and so lure into their ranks the men who might otherwise develop into very efficient helpers, if not partners, for the architects. This is a condition which, of course, we cannot alter by any regrets, and as a matter of fact the ingress of the architect into the domain of the engineer has been even more pronounced than that of the engineers into our pastures, so that we really have very little to complain of; but there is a principle which is more or less overlooked and which is worthy of pretty careful consideration by the draftsmen themselves. The temptation to accept the highest bidder when selling one's services is a perfectly natural one and implies no lack of ideals on the part of the one who is so bid for, but though fundamentally we are justified in assuming that every draftsman, even though he remains such, wants to acquire training which will fit him to be an architect, and there is no argument on the fact that the more he imbibes the true spirit of architecture, the greater his happiness in the profession will be and the greater his worth. Consequently it would seem fair to sound a little warning for our young men who are starting out as draftsmen to urge them to exercise more care and more discretion in selecting the architect with whom they shall associate themselves. It is seriously to be doubted whether the high salaries that the corporations would pay to its draftsmen would be a fair offset for the lack of personal interest in the work and the development of real creative architectural work, for the difference between the engineer and an architect very usually lies in the fact that the one does things and the other thinks them out, that the one is concerned with an exact solution and the other seeks an ideal, that the one deals with figures and facts and the other deals with the imagination and the creative thought. So that while it is perfectly possible for a draftsman to learn a good deal from our engineering friends, what they get is not architecture so much as business training, very excellent in itself, but a very poor substitute for creative art.

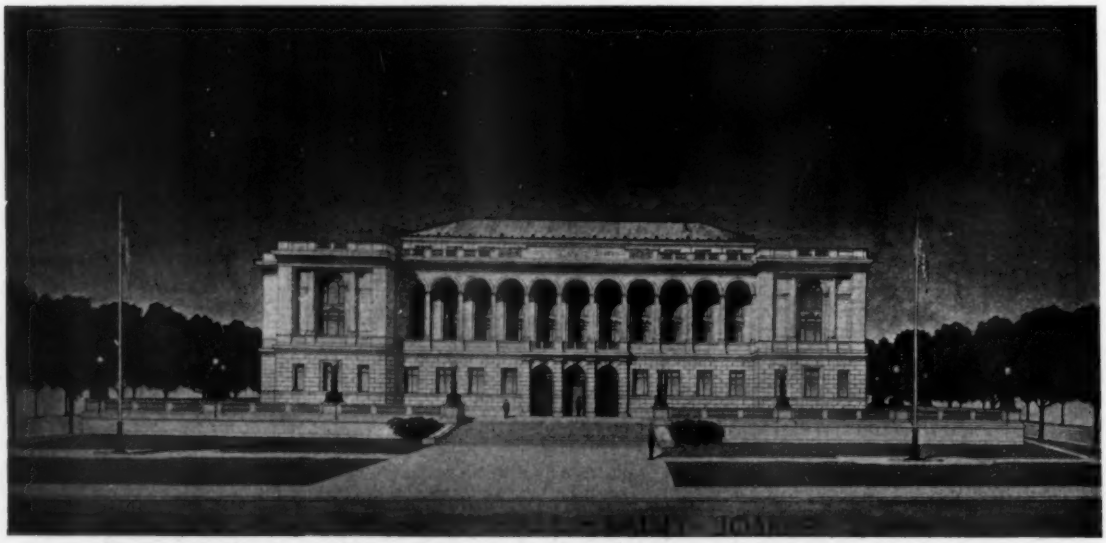
It would then seem that the young man who really wants to conquer in his profession, to attain the control of the faculties which make for creative design, should first of all ask not what wages he can secure, but what kind of man, what sort of personality would appeal to him most and enable him to grow in the most advantageous manner. This does not necessarily mean the architect who has the largest amount of work, for very often some of our best work is done by architects with very limited practice, but it does mean that the draftsman in seeking his architectural employer should distinctly seek for the very best and associate himself with artistic growth rather than mere business efficiency. As a matter of fact, the business of architecture, while of a great deal of importance to the architect himself, enters very little into the development of the draftsman. The point is if a man is to be a draftsman, he ought to try to be the best draftsman his powers will enable him to become, and to do that he ought to seek the very best environment and to be where he can imbibe with his daily work something a great deal more in artistic and creative worth than a mere salary.

This is all very easy to say, but it is readily appreciated how hard it is for a beginner, perhaps just out of college, to know what to look for, and perhaps it can be made a little more available by giving it a personal turn. If I were a young man seeking a position as a draftsman, I would first of all look for an architect with imagination, who can dream dreams and make them realities in stone and brick. Next, I would associate myself if possible with a man who is a draftsman, who can interpret his own ideas with pen and pencil and put those ideas in tangible shape. Preferably I would associate myself with a young man who had started rather recently in business. The older firms are apt to be more or less conservative and rooted, and I would feel that the inspiration of the young man would offset the experience of the older one. So it would not matter so much what the man had done in the way of actual buildings so long as he could show his enthusiasm, his draftsmanship and his creative ability.

Of course, it goes without saying that I would prefer a man who is innately a gentleman, who had a background of culture and who had received a liberal as well as an architectural education, for that kind of man is more apt to be able intelligently to impart his ideas, though culture is not necessarily an appanage of architectural ability. There are those who have a feeling that a rough-neck can design as well as a gentleman and that the free and easy, offhand Bohemian atmosphere is more inducive to high art than the atmosphere of culture and refinement. I do not think so. If I were selecting an architect, I would avoid the rough-necks and play with gentlemen, and especially I would try and find a man of real character. That counts a great deal, especially if a young man expects to learn from his employer. Furthermore, I should give preference to a man who not only has a good architectural library, but who uses it in his daily work and whose library is not tucked away under lock and key, but put always at the disposal of the younger man.

Then I should consider very carefully the character of those who would probably be in the office with me, for after all the draftsmen learn quite as much from each other as they do from the boss, and I should want to pick my associates very much as I would pick the man to whom I would look for my chief inspiration. And least important of all would be the amount of money I would receive. A draftsman is seldom underpaid nowadays. Many of them are possibly overpaid and I would feel if I got the real meat of the profession from the employer and my associates, it would matter very little what my relative salary might be.

This point of view is not mere altruism, but all these qualities go to make up the kind of man from whom a young draftsman will be most apt to learn and learn the things which will profit him, and if there were more care shown by the younger men in picking out their associates, everyone would be the gainer thereby. At present there is a dearth of draftsmen. The demand far exceeds the supply and it behooves the young man to select carefully and when he has made the choice, stick to it. The old saying is that evil communications corrupt good ones. The converse is certainly true, and good associations will bring out the best that is in the man, make him of more value to himself, to his employer and to the community.



CITY HALL, ST. JOSEPH, MO.

ECKEL & ALDRICH, ARCHITECTS—McKIM, MEAD & WHITE, CONSULTING ARCHITECTS

ENGINEERING *and* CONSTRUCTION

ELECTRIC ARC WELDED STRUCTURAL STEEL FRAME SHOP BUILDING FOR THE C. B. & Q. R. R. AT EOLA, ILL.

The ADAPTABILITY *of* ELECTRIC ARC WELDING *to the* FABRICATION *of* STRUCTURAL STEEL

BY A. G. BISSELL*

THE assembling together of the parts of a structural steel frame by electric arc welding has been accomplished. Whether this will become a universal custom or not depends entirely on the surety that such a method can be made a practical process in the field at a cost less than now entailed by riveting the connections. It is possible that the weight of "details" can be reduced by this method which would be one important contributing factor to its success. What the future holds in this possibility is not known, neither was it known when the first structural steel frame was erected. A study of the data presented in this article is worth while and it offers an interesting field for engineering speculation.—THE EDITORS.

DURING the late war the necessity of speeding up production in the various industries brought about the development of electric arc welding. At that time its use in the ship yards probably attracted the greatest attention even though it had been in use some little time before in the railroad shops and steel foundries. In the ship yards it was not long before arc welding was used to replace riveting and other methods of joining parts in steel ship construction. At about this same time arc welding was used in the erection of small structural steel buildings.

At all times there has been more or less discussion as to whether arc welded joints in structural material would withstand the various stresses to which such a structure would be subjected when supporting live loads. It has been the opinion of many that an arc welded structure subjected to vibration or shock would quickly fail in the arc weld metal or the adjacent metal. These opinions were not entirely unfounded as tests made upon specimens existing entirely of arc weld metal have shown this material to have a lower resistance to fatigue and impact than structural steel. However, it should be noted that in an arc welded joint in structural steel the strains are not concentrated in the arc weld metal.

Many tests have been made in connection with the fabrication of structural steel by arc welding, but up to the present, the writer has found no record in the literature of tests by vibration in impact in such structural fabrication. Therefore, in order that information might be obtained that would throw some light on the resistance that structural steel fabricated by arc welding would offer to vibratory and impact strains, several test

*General Engineer, Westinghouse Electric & Manufacturing Company.

pieces were made and subjected to static, fatigue and impact loads. In these tests a joint was used that would approach that which would be used in actual practice. Clip angles, reinforcing plates and other extra items ordinarily used in riveting were eliminated. The joints tested were made by

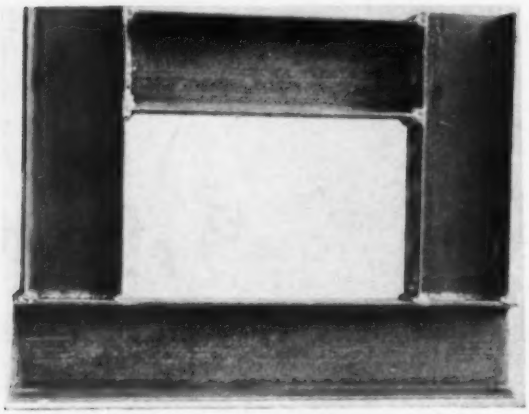


FIG. 1. TEST PIECE FOR STATIC TEST BEFORE TESTING

joining 6″ x 12.25 pound I-beams to other members.

STATIC: A test piece to show the resistance of arc welded joints to a static load was made by uniting four 6″ x 12.25 pound I-beams, as shown in

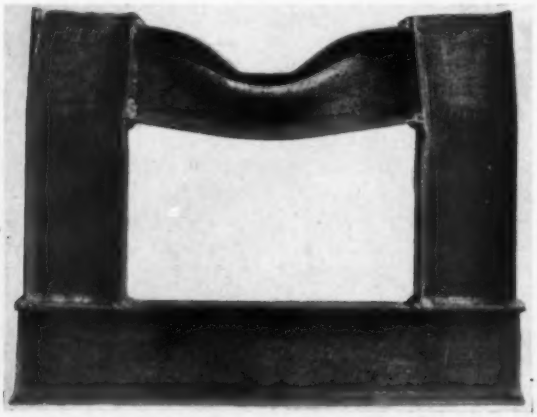
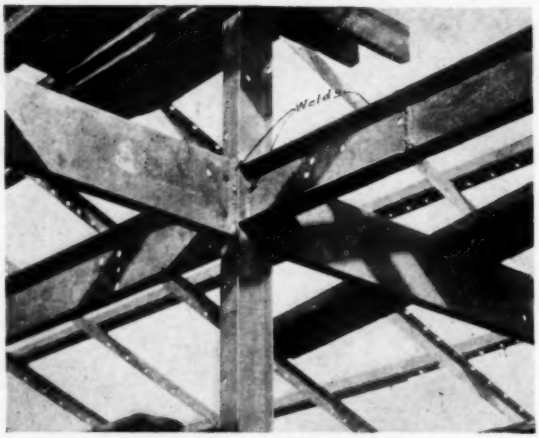


FIG. 2. TEST PIECE FOR STATIC TEST AFTER TESTING

Fig. 1. In this test piece the 18″ horizontal cross member was attached to the flanges of the vertical members by fillet welds around the contacting parts as shown in the illustration. To test this structure it was placed in a hydraulic press and pressure applied to the center of the horizontal member through the end of a piece of 3″ shafting.

At the pressure of 40 tons the horizontal and vertical members began to deform, the pressure falling to 35 tons. This pressure was applied until the horizontal member was deformed as shown in Fig. 2. The extent of the crushing was limited by the base I-beam which deformed as shown in Fig. 3, causing the test piece to slip out of the press. An examination of all the joints in this test piece after the test failed to show any evidence of failure in the welded joints showing that a joint of this nature will hold even though the connected members may be badly deformed.

FATIGUE: To determine the effect of vibration on arc welded joints in structural steel, a test piece was constructed of two 10″ x 25 pound I-beams to one of which were arc welded four 6″ x 12.25 pound I-beams 24″ long. To the other was riveted four 6″ x 12.25 pound I-beams 24″ long.



DETAIL OF ELECTRIC ARC WELDED STRUCTURAL STEEL FRAME IN THE SHOP BUILDING FOR THE C. B. & Q. R. R. AT EOLA, ILL.

As can be seen in Fig. 4, the 6″ I-beams are attached to the web and flanges of the 10″ I-beam by a fillet weld. The only preparation required in making these joints was to clean the scale from the parts to be welded. These welds were made by an average welder working under the same conditions that might be expected in actual practice. Each joint required approximately 0.6 lbs. of metal and from 12 to 15 minutes to weld, using 5/32″ wire at 150-160 amperes. This makes the cost of this joint about 35¢ for the welding if the operator receives $1.00 per hour.

A riveted joint uniting the members in a similar manner is shown in Fig. 5. Two 6″ x 12.25 pound I-beams 24″ long were riveted to the web of the 10″ x 25 pound I-beam. A standard beam connection was used as specified on page 246 of the Carnegie Steel Company Pocket Companion, Twentieth Edition, 1919. This shows that beam connections for 7″, 6″, 5″ I-beams are made using 2 Ls 6″ x 4″ x ⅜″ x 0′-3″with two ¾″ rivets through the web of the I-beam attaching

the 6″ leg of the angle clips. One ¾″ rivet through the 4″ leg of each clip attaches the latter to the web of the other member. In this test piece, in order that the 6″ I-beam might be attached to the web of a 10″ I-beam, it was necessary to use 6″ x 3½″ x ⅜″ angle clips and space the two ¾″ rivets 4½″ instead of 5½″. Otherwise the joint was standard. This joint is shown in detail by drawing in Fig. 6.

FIG. 3. END VIEW OF STATIC TEST PIECE SHOWING FAILURE IN BASE

In order to have a 6″ I-beam attached to the flange of the 10″ I-beam by riveting, a joint as shown in Fig. 6 was calculated. Two 4″ x 4″ x ¼″ x 0′-3″ Ls were riveted to the flanges of the two members by ⅝″ rivets, two rivets being used through each leg of the clip angles. In both of these riveted test pieces the rivets were driven hot by hand.

Both riveted and welded test pieces were mounted on a one inch plate 14″ x 22″ by uniting the 10″ I-beam and this plate by a fillet weld. This combined test piece was securely bolted by 4-1″ bolts to the bed plate of a vibratory test machine and subjected to a vibration or vertical movement of $\frac{1}{16}$″ at the rate of 1760 complete cycles per minute.

This vibratory testing machine is shown in Fig. 7. It consists of a pulley (A) having 8 flat surfaces equally spaced around the external face, mounted in extra heavy bearings and driven at 220 R.P.M. through pulley (D) by a motor. Just above (A) is a smooth faced pulley (B) attached by heavy bearings to the bed plate (C). This pulley (B) and bed plate (C) are free to move in a vertical plane. As pulley (A) is rotated its flat faces cause pulley (B) and therefore the bed plate (C) to rise and fall $\frac{1}{16}$″. To make this bed plate return immediately after rising, an air pressure piston is installed at each side (F & E) which keeps constant down pressure on the bed plate and insures contact between pulleys A and B. Pulley D is operated at a speed of 220 R.P.M. which gives the bed plate 1760 vibrations per minute.

In order to identify the members of these test pieces they were marked as follows:—

1 R and 2 R Riveted to opposite sides of web of 10″ I-beam.

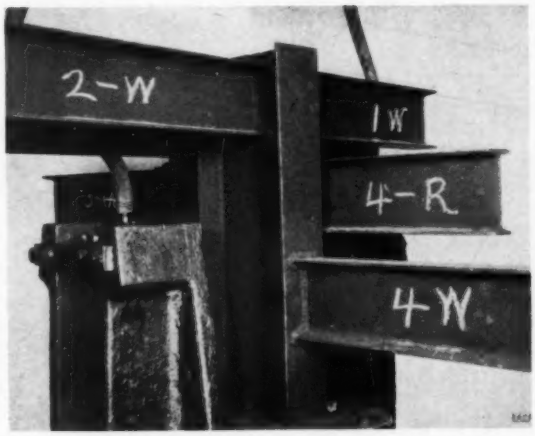


FIG. 4. VIBRATION TEST PIECE SHOWING ARC WELDED CONNECTIONS

3 R and 4 R Riveted to the flanges of the 10″ I-beam.

1 W and 2 W Arc welded to the opposite sides of web of 10″ I-beam.

3 W and 4 W Arc welded to the flanges of the 10″ I-beam.

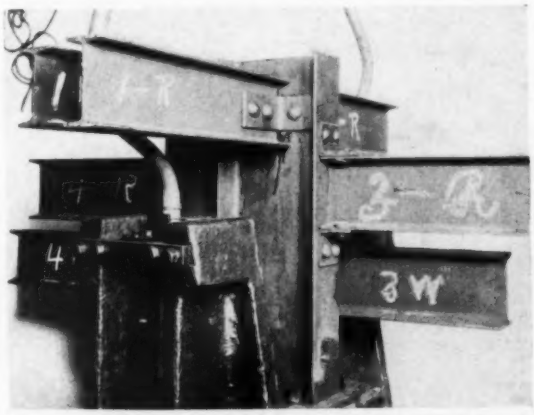


FIG. 5. VIBRATION TEST PIECE SHOWING RIVETED CONNECTIONS

The first test period lasted 18 hours and 20 minutes. At 24 minutes of vibration the lower clip angle on specimen 3R failed. At 42 minutes the lower clip angle in 4R failed. At one hour the upper clip angle on 3R failed removing the member. 4R was removed when the remaining clip angle failed at two hours and four minutes. The nature of the failures can be seen in Fig. 8.

It will be seen that the failure was due to the fatigue of the metal in the clip angles.

Within an hour after the vibration was started the clip angles on 1R and 2R began to show a movement that increased until at 3 hours and 45 minutes the rivets had been loosened sufficiently to allow a movement of ¼" at the free end of both 1R and 2R. After 4 hours and 15 minutes this movement had increased to ½". By this time the vibration was exerting very little effect as these members were so loose that they received but few of the shocks simply bouncing up on about every fifth or sixth vibration. The result of this movement was to swedge the rivet down to a reduced cross section and enlarge the rivet holes.

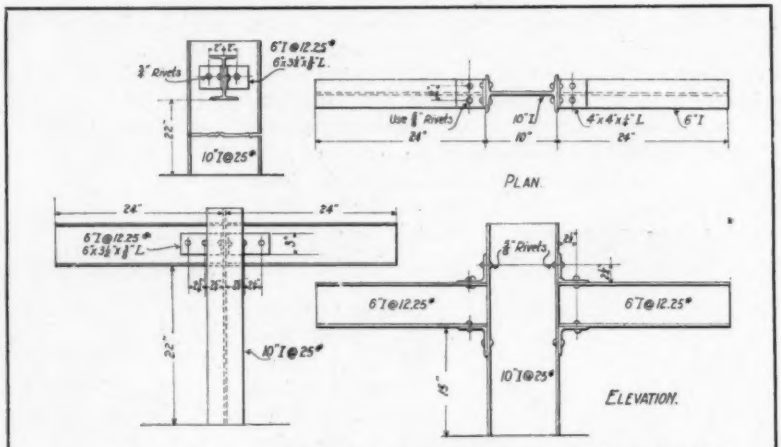


FIG. 6. DRAWINGS OF VIBRATION TEST PIECES SHOWING DETAILS OF RIVETED CONNECTIONS

FIG. 7. VIBRATORY TESTING MACHINE

During this time the arc welded test piece attached to the same base was receiving the same vibrations. At all times during the 18 hours and 20 minutes the arc welded members gave a clear ring when struck with a hammer showing that no failure had started in or about the welds in the first period of the test. It might be mentioned here that all four of the holding-down bolts through the base of the test piece failed from fatigue showing to some extent the severity of the test.

As it appeared that it would require considerable time to produce a failure in any of the arc welded members, it was decided to attach a load to the end of each arc welded member and thus accelerate the test. Sections of 6" shafting weighing 25 pounds each were arc welded to the lower flange at the extreme end of each of the arc welded members and vibration continued for 22 hours and 10 minutes.

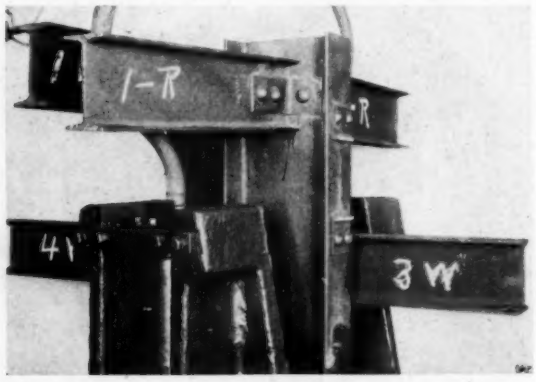


FIG. 8. RIVETED VIBRATION TEST PIECE AFTER FIRST TEST

At the end of an hour on the second period the web surrounding the section to which members 1W and 2W were attached failed. It will be noticed in Fig. 9 that these members are still securely attached to each other through a section of the web. After 20 hours and 40 minutes on the second period and a total of 39 hours and 5 min-

utes, the flange and web of the 10″ I-beam to which 3W was attached failed as shown in Fig. 9. This failure was probably due to the web of the 10″ I-beam cracking down from the top. Had this crack not occurred 3W would have probably held indefinitely as at the end of this period 4W was intact and there was no evidence of failure in the weld in surrounding metal. After 3W was removed the vibration was continued for an addi-

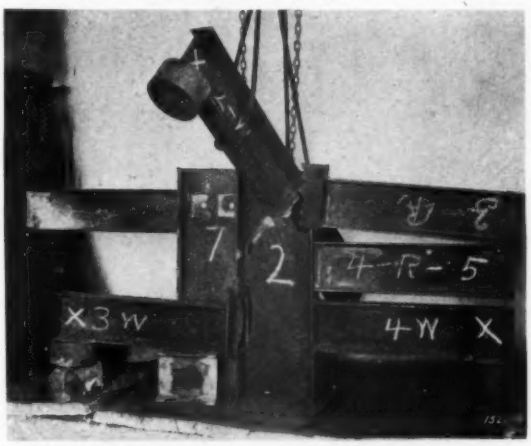


FIG. 9. VIBRATION TEST PIECE AFTER SECOND TEST

tional hour but owing to the damaged condition of the 10″ I-beams which were badly cracked, the test was discontinued.

SHOCK: After having found that the arc welded joints in structural steel were capable of withstanding as much static and vibratory loading as the structural members themselves, the only remaining test data to be obtained was the effect of shock in these joints. The test piece to be subjected to a sudden shock shown in Fig. 10 was made by arc welding two 6″ x 12.25 pound I-beams 24″ long to a ½″ x 3″ base plate. These vertical I-beams were joined near the tops by a similar I-beam of the same length. This I-beam was attached to the flanges of the vertical I-beam by fillet weld having approximately ⅜″ contact on each member. To receive the blow an 8″ piece of 6″ I-beam, capped with a piece of 1″ plate, was attached to the center of the upper flange of the horizontal member. To prevent the vertical members from collapsing and the base from buckling, the bracing shown in Fig. 10 was installed. Since the horizontal member was attached quite near the tops of the vertical members, caps were welded to the top ends of the vertical I-beams to prevent them from splitting through the web.

This test piece was placed on a solid foundation consisting of a heavy plate supported by the anvil and two 12″ x 12″ timbers under a 2000 ton steam hammer shown in Fig. 11. First a light blow was delivered upon the plate on the extended I-beam to settle the set-up. The effect of this blow was not evident so a blow of approximately ⅓ the capacity of the hammer or about 700 tons was delivered on the 1″ plate that capped the extended I-beam. The impact of this blow drove this short I-beam into the horizontal member which in collapsing drew in the vertical I-beams bending them at the top of the cross braces as shown in Fig. 12. There is no doubt but that a very severe shock strain was transmitted through the welded joint that connected the vertical and horizontal members, more severe in fact than any structure would be expected to stand in practice and yet the welded joints did not fail.

SUMMARY: Arc welded joints in structural steel members prove strong enough to remain intact while the structural steel members were badly deformed under a static load of 40 tons.

When subjected to vibration of 1760 reversals per minute, arc welded joints surpassed standard riveted joints in permanence, and showed a longer

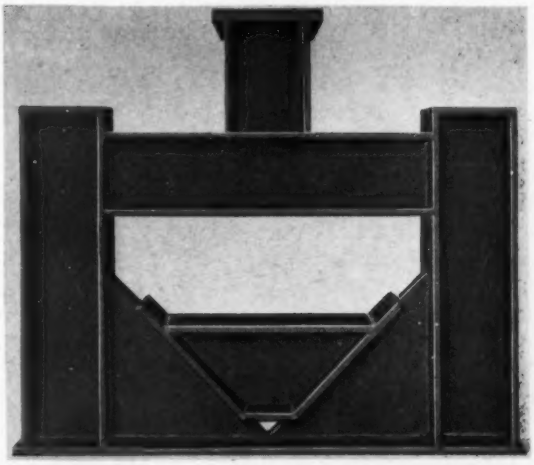


FIG. 10. SHOCK TEST PIECE BEFORE TESTING

life than the structural materials which they joined.

Under a sudden shock produced by a blow of approximately 700 tons the arc welds in a test piece did not fail even though the structural steel members were severely strained and deformed.

CONCLUSION: From the results of the foregoing tests it is concluded that arc welded joints in structural steel are capable of withstanding any stresses that the structural member will withstand without deforming and will remain intact even after the structural members are deformed or broken. Under a steady pressure and under shock, the welded joints are capable of remaining intact, even though the structural steel members that they unite are badly deformed. Under vibration, contrary to the expectation of many, the arc welded joints do not fail nor do the failures appear to be

FIG. 11. SHOCK TEST PIECE AND 2,000 TON STEAM HAMMER USED IN TEST

due to rearranged structure in the surrounding steel, resulting from the welding.

In regard to the cost, it may be said a 3/8" fillet weld as used in these joints can be put in for be-

FIG. 12. SHOCK TEST PIECE AFTER TESTING

tween 15¢ to 20¢ per linear foot of bead, depending upon the position of the work. This is based upon labor at $1.00 per hour, wire at 10¢ per pound and electrical energy costing 2¢ per KWH.

MAKING STRONGER CONCRETE

WATER is an important ingredient in concrete. Experiments just completed at the Bureau of Standards, Department of Commerce, show that this is just as true with the new quick-hardening high-alumina cements as with Portland cement.

The Bureau finds it important to select sand and gravel in proper size gradation since less water is required to make the concrete workable and a greater strength results. The old rule, to use the least amount of water which will make the concrete workable, is found to hold with the new high-alumina cement. In one experiment a decrease of 1 per cent of water was found to increase the strength as much as 26 per cent.

The research is part of the program of the materials laboratories of the Bureau upon the useful properties of materials and how they may be enhanced.

A gravel concrete made with the new quick-hardening high-alumina cement generally develops as high a strength in 24 hours as a similarly proportioned Portland cement concrete would develop in 28 days. This quick-hardening feature is notably valuable where ground rentals are high, equipment elaborate, or construction difficult, or wherever delays in waiting for the concrete to attain its strength would be costly.

PROPOSED MEMORIAL CHAPEL FOR WESTMINSTER ABBEY

THE Dean and Chapter of Westminster, it is learned, have decided to convert the enclosure at the southwest corner of the nave into a chapel in memory of all those, known and unknown, who gave their lives in the Great War. In this chapel will be placed a tablet of brass inscribed with the names of the old choristers and other members of the Abbey staff who fell in the war.

WELDING SOCIETY MEETING

THE American Welding Society will hold its fall meeting on October 21-23 at the Massachusetts Institute of Technology at Cambridge, Mass. Exhibits of welding and actual demonstrations will be made beginning at 9 A. M. and lasting until 5 P. M. each day. Five technical sessions are scheduled.

AMERICAN INSTITUTE OF STEEL CONSTRUCTION

THE annual convention of the American Institute of Steel Construction will be held at White Sulphur Springs, West Virginia, November 11-14. Headquarters will be at The Greenbrier. This is an important meeting for all who are interested in steel as a structural material and in major building construction.

WHEN *is a* BRICK?

THIS is not a frivolous question but one propounded in all sincerity. By common consent and usage by laymen and builders since the remote days of Chaldea, a brick has been considered to be a rectangular block of clay and none other. Webster defines a brick as:

A building and paving material made from clay (either pure or mixed, as with sand, lime, etc.) by molding into blocks while moist and hardening it in the sun or by fire.

An individual molded block of the above material usually rectangular. The average size of an English brick may be taken as 2⅝ x 4⅛ x 9; of an American brick 2¼ x 4 x 8.

Any oblong rectangular mass; as a brick of maple sugar; a penny brick (of bread), etc.

This corroborates the custom of ages. But now comes the Building Code Committee of the Department of Commerce in its report "Recommended Minimum Requirements for Masonry Wall Construction"* which defines brick and tile in Notes 2-3, page 5, as follows:—

2. Unless otherwise stated units of materials other than burned clay, having the same general shape and size of brick, are for the purposes of this code considered as brick. (See Appendix, par. 9-1 reading: The requirements of many building codes date from a time when burned clay units were practically the only materials classed as brick. In order to prevent any misunderstanding of its recommendations, therefore, the committee believes it best to point out specifically as in Part II, Section I, note 2, that for the purposes of this report, unless otherwise stated, units of other materials having the same general shape and size as brick are included with those of clay, it being understood that all units shall meet the test specifications provided herein.)

3. Unless otherwise stated the term "hollow tile" used without a qualifying adjective, is understood to mean clay hollow tile.

Sold by the Superintendent of Documents, Government Printing Office, Washington, D. C. Price 15 cents.

It has never been the common custom to apply the qualifying adjective "clay" to either brick or hollow tile. It is the common custom to apply the qualifying adjectives "sand-lime, concrete and cinder-concrete" to brick shaped blocks made of those materials. The word brick instinctively associates itself with that most durable of materials, burned clay. It is not clear why this attempt is made to rob brick of its age-old identity and classify with it other materials of entirely different characteristics and made by entirely different processes. The committee report does not offer any satisfactory justification for this proposal.

The table given is the combination of several tables contained in the report, so arranged as to make comparisons more easy.

Brick Bearing Walls

Unit	Recommended maximum unit working stresses			Absorption limits		Compressive strength		Modulus of rupture	
	pounds per square inch			per cent		pounds per square inch		pounds per square inch	
	Portland cement mortar	Natural cement or cement-lime mortar	Lime mortar	Mean of 5 tests	Individual maximum	Mean of 5 tests	Individual minimum	Mean of 5 tests	Individual minimum
Brick (clay) medium grade	170	130	90	12-20*	24*	tested on edge* 2000 or over	tested on edge* 1500	450 or over*	300*
Sand-lime Brick	170	130	90			tested flat**	tested flat **		
Concrete Brick	170	130	70	not more than 12***		not less than 1500	not less than 1000		

Brick Non-Bearing Walls

(Wall supporting no load other than its own weight)

Brick (clay) soft grade				20 or * over	no * limit	tested on edge * 1000 or over	tested on edge * 800	300 or over *	200*

*A.S.T.M. Standard Specifications. Absorption ascertained by boiling an individual brick in water 5 hours.

**A.S.T.M. and American Concrete Institute tentative specifications permit testing flat.

***Ascertained by immersing a dry concrete brick in water for 24 hours, except that for such brick weighing less than 125 pounds per cubic foot the average absorption in per cent by weight shall be not more than 12 multiplied by 125 and divided by the unit weight in pounds per cubic foot of the concrete under consideration. (See Appendix paragraph 9-5 reading: The modification for light concrete is made necessary by the increasing manufacture of units made from light aggregates.)

Before discussing the relative factors of this table, the following quotation is made from the report of the proceedings of the A.S.T.M. Committee C-3, on page 157, part I of two volumes, 1915.

"Objection has been raised, especially by Prof. A. N. Talbot and the Pittsburgh Laboratory of the Bureau of Standards against the testing of half-bricks in the flatwise position, owing to the difficulty experienced in obtaining well defined failing points, and the fact that the values are frequently in excess of the true strength. This is to be expected from Bauschinger's relation, and it would seem desirable to consider whether the half-bricks might not be tested on edge or whether the German practice of cementing together two half-bricks is a feasible proposition. The testing laboratory of the Ohio State University and the Bureau of Standards, are now carrying on work in connection with this question. At the Bureau of Standards, in testing 178 bricks from 15 plants within a radius of 150 miles from Washington, D. C., the average compressive strength, flatwise, was found to be 6,226 lbs. per sq. in.; edgewise, 5,399 lb. per sq. in. The ratio of the results thus obtained by these methods of testing was 1.153:1. The tests of the bricks tested on edge were very much more satisfactory, resulting in definite failing points."

It will be noted that the edgewise strength of brick is only 86.7 per cent of the flatwise strength in which position bricks are laid in the walls.

In the proceedings of the A.S.T.M. Vol. 24, Part II, 1924, appears a paper by S. H. Ingberg, Physicist, U. S. Bureau of Standards, entitled "Factors Affecting Brick Masonry Strength." In this paper Table I gives the results of tests made on brick, sand-lime brick and concrete brick. The average compressive strength of concrete brick tested flatwise was 3129 pounds per square inch and tested edgewise it was 1486 pounds per square inch.

It is noted that the flatwise strength is 210.5 per cent greater than the edgewise strength. It is apparent that the requirement that brick be tested edgewise and that concrete brick be tested flatwise, imposes a handicap on the former and gives a tremendous advantage to the latter. The ratio of the strength of concrete brick tested edgewise and flatwise, as determined by Mr. Ingberg is as 1:2.105. The committee report states on page 6 that the average compressive strength of concrete brick tested flatwise shall be not less than 1500 pounds per square inch and that the compressive strength of an individual concrete brick shall be not less than 1000 pounds per square inch. On this basis, by applying the ratio established by Mr. Ingberg, we have an allowable compressive strength of 713 pounds and 475 pounds per square inch, respectively, if concrete brick were to be tested *edgewise*—and yet the committee requires comparative strengths of brick to be not less than 2000 pounds and 1500 pounds, respectively.

The tests for absorption require that brick be boiled for 5 hours in water and that concrete brick (see page 6 of the committee report) be immersed in water for 24 hours. For concretes weighing less than 125 pounds per cubic foot it provides a method of determining the allowable percentage of absorption as noted below the table. For a concrete weighing 60 pounds per cubic foot the allowable absorption would be 25 per cent.

It is noted that no tests for the modulus of rupture is required for concrete brick. "Soft" brick must have a compressive strength of at least 1000 pounds per square inch when tested edgewise and usable only in non-bearing walls. Concrete brick permissible in load bearing walls, would not be required to have a compressive strength greater than 713 pounds per square inch if also *tested edgewise*.

All of the possible comparisons are not here noted, but a sufficient number have been made to indicate that advantages and handicaps are a feature of the report. The reasons for this are not clearly explained.

The American Architect has no interest in any material, process, person or organization. It aims to render exact justice to all. The American Architect recognizes that it is but natural for human beings to secure advantages for themselves and that it is also natural to handicap competitors if possible, but it also feels that this tendency must be restrained and regulated so that equal opportunities accrue to all. It deplores the necessity of calling attention to the confusing elements of this report of the Building Code Committee and recommends that those persons who may be engaged in the writing and the adoption of new building codes or the amending of existing codes, give very careful and unbiased study to all of the provisions of the committee report.

Among the kinds of brick not mentioned in this report are gold bricks.

The LAW *as to* ARCHITECTURE

BY CLINTON H. BLAKE, *Jr., of the New York Bar*

IN country work, the questions of party walls do not often arise. In city work, however, the party wall is a very usual condition, which must be considered and handled intelligently. In a recent case, a client of the architect desired to erect a building against the existing wall of another building, and to purchase either the right to use the wall which was placed entirely upon the land of another, or to buy the fee of one-half of the wall. The architect, in advising his client, desired to ascertain which of these proceedings would be most advantageous; what would be the rights and liabilities of each of the owners of the party wall, if it were owned in common, and the corresponding rights and liabilities of the parties, in the event that the client were to purchase merely the right to use the wall and not including any title to the fee thereto.

As between the two alternatives, namely, the purchase of the right to use the wall or the purchase of the entire wall in fee, the former is in many ways more desirable. A purchase of the right to use the wall is ordinarily termed "acquiring an easement in the wall" and must be acquired by written agreement, which should be recorded in the same manner as a deed is recorded, inasmuch as the purchaser of an easement acquires an interest thereby in the real property. The respective rights and liabilities of the parties will depend upon the terms of the agreement. If the agreement, however, is silent with respect to the upkeep of the wall, the duty will rest upon the owner of the wall to keep the same in such proper repair as may be necessary to give adequate support to the new building. The owner of land under the so-called doctrine of "lateral support" is entitled to have his land supported by the adjoining land. Where an excavation is made adjoining one's property, one is entitled to have the property supported so that no cave-in will occur and the readers of THE AMERICAN ARCHITECT are doubtless familiar with the many cases where claims for damages arise, based on failure of an excavating owner properly to protect the adjoining property in this respect. Cases where damage to the adjoining property is caused by improper shoring, undermining, plastering and the like are very common.

Where an easement of support in a wall is secured, the wall is made a party wall. The fact that it may stand entirely upon the land of the owner of one of the buildings does not change this fact. An agreement, giving an easement as distinguished from the purchase of the fee in one-half the wall will probably be the less expensive of the two alternatives. In some cases, the owner may place as high a value upon the easement as upon the fee, but ordinarily the expense for the easement should be less than where the actual title to half the wall is conveyed.

Assuming that the title to half the wall is acquired, rather than an easement, each of the owners will be obligated to keep the wall in a condition of repair sufficient to give the necessary lateral support to the building owned by the other. This duty will continue so long as the building of the other owner remains standing. Should either of the adjoining owners, therefore, desire to remove or alter his building, he must remember that the removal or alteration must be so conducted as not to deprive the other proprietor of this right of support. A somewhat similar ruling is in effect where the easement only is secured. Where one acquires an easement in a party wall, the adjoining owner will be required to maintain the wall at all times in such condition as to afford the lateral support to which the owner of the easement is entitled.

Either of the adjoining owners may extend the party wall in height so far as he may find it necessary to do so to meet the requirements of an alteration in height of his building. In making this addition to the height of the wall, he may extend the wall up through its entire thickness, if that be necessary for the proper support of his building. If he does this, however, the adjoining owner may avail himself of the use of the additional portion of the wall so erected. There is some conflict of authority, but the better view seems to be that, where he does avail himself of this use, he must compensate the owner, who erected the addition to the wall, for one-half of the cost thereof. When this is done, the new part of the wall becomes entirely a portion of the party wall and subject to the rules governing the latter.

In advising with respect to any party wall agreement, the architect will do well to bear these general fundamentals in mind and to remember that the more fully these contingencies are covered in the first instance, the less chance there will be of controversy between the two adjoining owners in the future. Differing statutory requirements may be found, of course, in different states, and the foregoing discussion must be taken, therefore, as general in character, rather than as applicable to every case. Where the problem arises, it will be well to secure adequate legal counsel in the state where the land is situated, before the easement or fee is acquired and the party wall agreement decided upon or entered into.

LEGAL DECISION

A CONTRACTOR sued the owner for a balance cliamed to be due upon a contract for the construction of a plumbing, steam heating and ventilation plant. The contract price for this work was something in excess of $27,000. The total cost of the building was about $186,000. The contractor made various substitutions of materials, without authority, and omitted various items. The omissions and variations consisted of the substitution of wrought iron screw fittings for cast iron fittings and of galvanized steel pipe for extra heavy cast iron pipe in certain connections; failure to cover certain of the hot water pipes with asbestos; substitution of galvanized iron sleeves for others specified; failure to install about 600 feet of radiation out of a total of about 3500 square feet, and to install certain air chambers, and half a dozen similar items.

As to some of these items, it appeared that the owner had ordered their omission, and as to others, that the products specified were unsuitable for the purposes of the building. It was determined, however, that the changes and omissions reduced the value of the building as a whole in the sum of about $2100, but did not substantially affect the usefulness of the plant nor affect its efficiency. The defendant claimed that the contractor could not recover because the contract had not been performed as agreed. The contractor claimed that there had been a "substantial performance" in good faith and that he was entitled to recover the contract price, less the amount allowed as damages.

The court held:

"The principal point presented in the case is the question of the right of a building contractor to recover the contract price where he has not completely performed the contract. The law in this state on this subject has been considered in several recent decisions and is now comparatively well established. The general rule on the subject of performance is that—

'Where a person agrees to do a thing for another for a specified sum of money to be paid on full performance, he is not entitled to any part of the sum until he has himself done the thing he agreed to do, unless full performance has been excused, prevented, or delayed by the act of the other party, or by operation of law, or by the act of God or the public enemy.' *Carlson vs. Sheehan*, 157 *Cal.* 696, 109 *Pac.* 30.

"This, of course, refers to actions upon the contract for the contract price. The right to sue on an implied contract for the value of a partial performance is a different question, and is not here involved. The rule just stated is that prevailing at common law. It has now been greatly relaxed, and it is settled, especially in the case of building contracts, where the owner has taken possession of the building and is enjoying the fruits of the contractor's work in the performance of the contract, that if there has been a substantial performance thereof by the contractor in good faith, where the failure to make full performance can be compensated in damages to be deducted from the price or allowed as a counterclaim, and the omissions and deviations were not willful or fraudulent, and do not substantially affect the usefulness of the building for the purposes for which it was intended, the contractor may, in an action upon the contract, recover the amount unpaid of his contract price less the amount allowed as damages for the failure in strict performance."

The court further held that where the owner has taken possession of the building and is enjoying the benefit of the work done by the contractor, the contractor may recover the contract price, less a proper allowance for damages to the owner, if there has been a substantial performance by the contractor in good faith, if the owner can be properly compensated in damages for any failures in the performance, if the omissions or deviations from the specifications by the contractor are not willful or fraudulent and do not substantially affect the usefulness of the building for the purposes for which it was erected.

It is to be noted with reference to the foregoing decision, that while the sum of $2180.88 was allowed as the proper amount of damage caused by the omissions and deviations, the court, after a careful analysis of this figure, found that the substitutions did not substantially affect the serviceability of the building and that the difference in cost between the actual cost of the articles substituted and of those specified was very small.

Haverty Company v. Jones, 197 *Pacific* 105.

AWARDS TO SKYSCRAPER WORKERS

THE last brick was laid and the last stone set recently in the new telephone company's big structure, known as the Barclay-Vesey Building, New York City. Certificates were awarded to a bricklayer and a stone cutter, in recognition of their superior work.

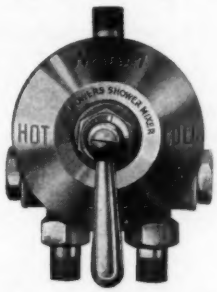
The Barclay-Vesey Building occupies the entire city block facing on West Street, between the two cross streets from which it takes its name. The architects had to take into consideration the problem of "bigness" and many months of design and estimating were required. The building provides 850,000 square feet of space and capacity for 6,000 workers.

The committee of award consisted of a representative of the New York Telephone Company, a representative of the firm of McKenzie, Voorhees & Gmelin (the architects), a representative of Marc Eidlitz & Co., the builders; J. J. Collins of the Tunnel and Excavators' Union, representing labor, and Stephen F. Voorhees, President of the New York Building Congress.

Only the bricklaying and stone setting trades were recognized at the present time, but awards will be made later to outstanding members in several other trades.

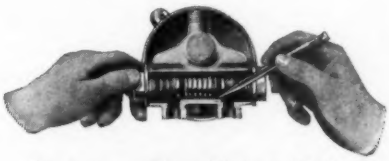
This plan is part of the program of the New York Building Congress to lay emphasis on the value and essential importance of craftsmanship; to stimulate interest, and to recognize conscientious pride in workmanship.

(2199 G)



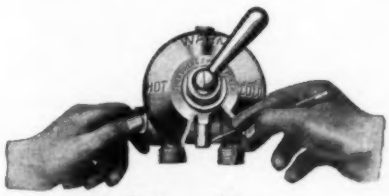
The Powers Shower Mixer

It is not thermostatic, yet it has the safety feature found in thermostatic mixers. Two remarkable improvements make it entirely different from all other mixers; they are—



Pressure Equalizing Valve

This important feature eliminates scalding and unexpected changes in the temperature of the shower, caused by pressure changes in supply lines due to use of nearby showers, faucets, and flush valves, or failure of cold water supply.



Safety Stop

Three important advantages are gained through this feature: (1) It protects the bather from scalding caused by a "dead end" in the hot water supply line. (2) It saves fuel by eliminating waste of hot water. (3) It reduces decorating expense by preventing steamed-up bathrooms.

Write for Book

To those interested in greater comfort and safety in shower baths, we shall be glad to send our book describing this unique Safety Shower Mixer, and giving the opinions of many users who have torn out other mixers and installed POWERS.

This *never* happens with the Powers Shower Mixer

Have you ever stepped into a shower bath, turned the handle of the mixer till the temperature of the water was just to your liking, and then, when you were enjoying its luxury, have an unannounced "shot" of cold or HOT water make you jump to save your hide?

Serious injuries, and lawsuits, sometimes result from this common trouble. Last October Leopold Godowski, the famous pianist, was severely scalded while taking a shower in a New York hotel. Now he is suing the hotel for $50,000.

Another New York hotel was sued for $100,000 by the widow of a prominent Philadelphian who died from the scalding received in a shower bath.

But where Powers SAFETY Shower Mixers are used there is no danger of scalding, and there are no unwelcome temperature changes to annoy a bather. These Mixers save water, reduce repair bills, and add greatly to comfort.

You will find practical advantage in knowing why this Mixer is replacing old style mixers in so many leading clubs, hotels, and residences. Your clients will enjoy its unfailing protection, and you will enjoy their unending gratitude. *There has never been another like it.*

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THE REBUILDING OF TOKYO AND YOKOHAMA

WRITING in *The Times*, of London, the Tokyo correspondent of that newspaper gives a vivid account of the cities of Tokyo and Yokohama as they are today—two years after the earthquake. He states: Tokyo may seem to the tourist an unlovely city of inexpensive buildings. There is hardly anything to suggest that what he sees is one of the most wonderful triumphs over misfortune ever recorded. Those who are a little inclined to ridicule some of the queer little shanties which the owners have been compelled by financial ruin to put up in place of the more pretentious buildings which existed before the earthquake, do not stop to consider how much more poorly a European capital might have done if it had been as hard hit.

This lesson is brought home the more by a visit to Yokohama, where the greater part of the work of reconstruction has been carried out by native capital and by the municipality. Not a single club, hotel, or shipping office has yet risen from the ashes of the Bund. A few temporary buildings, mostly residential, are to be seen, but none of them can be said in any way to take the place of the palatial edifices which formerly lined the Bund. Tokyo is just as liable to earthquakes as Yokohama or almost any other part of Japan; yet a dozen great buildings have risen, or are rising, in Tokyo, while nothing of the sort can be seen in Yokohama. Not only is the Bund still without any vestige of its former opulence, but the Bluff is, to all intents and purposes, as barren a hillside as it was on the days immediately following the earthquake. It is altogether different with the harbor facilities, which the Government have restored, and in some respects considerably improved. As a port Yokohama is almost normal, as a business center it is a mere shadow of what it was.

Tokyo has certainly gone ahead if it is still far from the modest ideal which the city fathers promulgated twelve months ago. They then planned to widen several hundred miles of streets—more than 50 per cent of the thoroughfares of Tokyo—by an operation entailing the complete or partial demolition of more than 100,000 houses. It will not be difficult to imagine the resistance that a civic earthquake of this kind met with from some of the property owners, especially when they were asked to forego compensation for the first 10 per cent of their property. Tokyo is a huge city, mostly of one storied buildings. I have noticed in only two places any serious attempt to comply with the improvement scheme. I have been unable to discover a single one of those perfect little parks which were planned to provide us with refuge in times of earthquake and with water in times of fire and punctured watermains. Until all the street widenings that were planned have been carried out, the provision of waterholes is a matter of little importance, as the fire engines are still unable to reach directly quite 10 per cent of the habitations.

Tokyo consists either of buildings of modern masonry, mainly concrete, or of wooden one or two storied structures. The two types are so intermingled that, except in the small business center known as Marunouchi near the Central station, no line can be drawn between them. Even in the Ginza, the Regent Street of Tokyo, lowly single storied shops stand side by side with vast department stores. No doubt in the fullness of time wood will give place to masonry, but that time is not yet. It is in the Ginza that the rudiments of a brighter and better Tokyo are to be seen, for that is the only thoroughfare that is not in danger of any widening operations. It is about as wide as Regent Street, and at present carries about a quarter as much traffic. Since the catastrophe of two years ago, in which every wooden house in the Ginza was burnt down and all the others were gutted, two immense department stores, Matsuzakaya and Matsuya, have sprung up. Of these, the second is by far the larger—larger even than the famous Mitsukoshi store, which is situated about a mile farther along the Ginza in a part called Nihombashi. Mitsukoshi, together with its stock valued at 3,000,000 yen, was gutted by the earthquake fire; it has now been more or less reconstructed. Matsuya's store resembles one of the great Paris stores in its construction and interior decoration.

WEATHER FORECASTS THAT SAVED MONEY

SPLIT redwood products stored in the forest take a high rate of fire insurance during the dry season, but during the rainy season no insurance is carried. The rains have continued later than usual this season, and a lumber dealer reports, through the Weather Bureau of the Department of Agriculture, that by closely watching the forecasts he has safely delayed insuring his products for more than three weeks, thus saving about $700 in premiums.

A company manufacturing cement that uses 27,000,000 gallons of lake water a day in operating steam turbines, suffered damage to its going machinery whenever the lake level fell below the water intake. On January 31, 1925, the weather map indicated conditions favorable for a sharp drop. The official in charge of the Weather Bureau station notified the company at noon that the lake level would fall a foot or more at a certain hour. The fall was so rapid that considerable damage would have resulted if the plant had not been shut down in response to the warning.

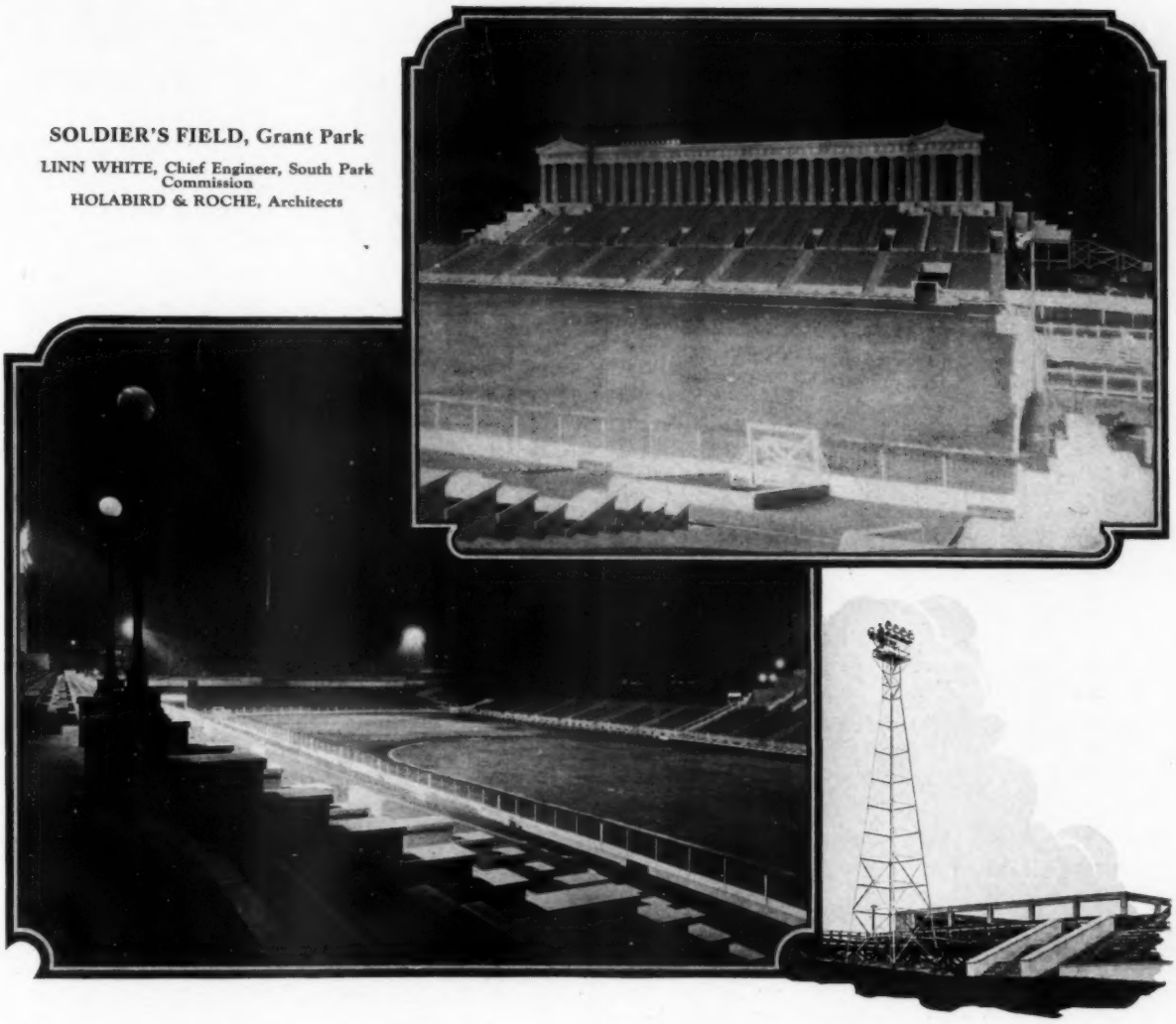
ROME'S FEW TREES DYING

THE city of Rome, known for its sun-baked, cobble-paved, treeless squares and streets, is being threatened with the loss even of what few trees still remain. During this Summer's customary drought some strange disease attacked hundreds of trees that flank only a few of the city's thoroughfares, with the result that many have shed their leaves and died.

Several newspapers are waging a campaign for a thorough investigation of the arboreal disease in the hope that the city's principal oases of greenery may yet be saved from destruction.

SOLDIER'S FIELD, Grant Park

LINN WHITE, Chief Engineer, South Park Commission
HOLABIRD & ROCHE, Architects



Soldier's Field—Grant Park, Chicago

beautiful and useful, night as well as day—

A total of forty Pyle-National floodlights placed on towers at the south end and mounted on the roof as shown, illuminate the stadium and grounds. Night performances can now be given for the entertainment of thousands who are unable to attend during the day.

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NEW YORK CITY FIRE LOSSES

THE fire losses of New York City are running between $39,000,000 and $40,000,000 per year, according to figures submitted at a recent meeting of the New York Board of Fire Underwriters. The seriousness of the fire loss situation in New York is a matter of much concern. The report of the Bureau of Fire for the year 1924 shows 22,631 fires, or 62 fires a day in greater New York, of which 418, or more than a fire a day, the fire department was unable to confine to the buildings in which they originated.

EMPLOYMENT INCREASES IN AMERICAN FACTORIES

EMPLOYMENT in American manufacturing industries increased .8 per cent in August over July, according to a recent announcement issued by the Labor Department, while aggregate earnings advanced 1.8 per cent and per capita earnings .9 per cent.

These figures were based on reports from 9,021 establishments in fifty-two industries, having 2,731,106 employees whose combined earnings during one week in August were $71,311,267. In July, 2,708,551 employees were paid $70,066,226 in one week by the same establishments.

The volume of employment in 8,029 establishments was 8.4 per cent greater in August of the present year than in August, 1924, and payroll totals increased 12.4 per cent.

AND STILL GROWING!

SINCE 1850 the population of the United States has doubled twice and more.

The wealth of the nation has increased forty times.

The value of imports has increased twenty-five times.

The value of the iron industry has increased eighty times.

And railroad traffic, measured in ton miles, has increased four hundred times.

REHOUSING SCHEME IN LIVERPOOL

PLANS have been prepared in Liverpool for a large rehousing scheme, which will involve the rebuilding of a residential belt affecting a population of at least 50,000, states a recent issue of *The Architects' Journal,* London. The problem of how to dispossess dwellers with the minimum of hardship is being considered, and it is believed that this can be done by the erection of two vast "clearing houses" for the accommodation of the first batch of families to be disturbed preparatory to the work of demolition. The Housing Committee propose to erect at the Dingle—the south end of the city—a ten story block of tenements for the first lot of residents to be removed, and a similar block of tenements for the north end is contemplated. The project has yet to obtain the sanction of the City Council and the Ministry of Health. The tenement blocks, if built, will represent a great improvement on the old type. Electric lifts will serve the higher levels, and there will be electric lighting throughout. Each living room will have a coal fire, and the provision of central heating and hot water system, as well as a central laundry, is being considered.

WREN'S MATERIALS FOR CITY CHURCHES

FROM *The Architects' Journal,* London, it is learned that a reminder of the great difficulties which Sir Christopher Wren had in securing materials for the rebuilding of St. Paul's, and city churches destroyed in the Great Fire, has been provided in the course of the removal of the coating of stucco from the outer walls of St. Lawrence Jewry by Guildhall, built in 1671. A portion of the north wall has been found to contain Roman bricks, old paving sets, and lumps of chalk. Mr. Underwood, the architect, states that this shows that Wren took any materials he could get from the ruins or elsewhere. The presence of the lumps of chalk is a reminder that for lack of other material he and his masons had to excavate under Blackheath and take that substance and use it.

THE NATION'S ROLLING STOREHOUSE

IN TIMES of normal business activity, the railroads of the United States carry daily approximately three and a half million tons of freight, states Elisha Lee, Vice President of the Pennsylvania Railroad. The estimated value of these commodities in transit every day is placed at several hundred million dollars.

While no one knows with any degree of accuracy how long on the average this great storehouse of wealth is locked under car seals, it is quite evident that it represents capital tied up and temporarily non-productive.

Therefore, the railroad is more than a mere physical carrier. It is a temporary banker for its patrons, as it is daily the custodian of a considerable part of the nation's credit. In proportion to the facility and dependability with which freight is moved, this credit is released and capital again permitted to function.

STATE ROAD BONDS

ABOUT four-tenths of the bonded debt of the states of the United States has been incurred for highway construction, it is reported. The exact figures as given by the Bank of America, New York City, are $626,852,350. The total state bonded debt for all purposes is $1,558,742,433. The proportion of road bonds is 40.2 per cent.

LUMBERING 700 YEARS

A SWEDISH lumber company is this year celebrating its seven hundredth anniversary. It is said to be the oldest lumber concern in existence. Because of its scientific methods, its forests, cut on a continuous yield basis, are in better condition today than ever before. Every seventy or eighty years the loggers turn to the same timber tract for cutting. The cut-over land problem does not exist.

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PETER B. WIGHT DEAD

PETER BENNETT WIGHT, student of art and life, builder and designer, early a Fellow and for many years a secretary of the American Institute of Architects, passed away at his home in Pasadena at the advanced age of eighty-seven years.

With his civic- and social-mindedness, Mr. Wight became, and continued to be, a large factor in the architectural life of Chicago in which city he passed the greater part of his professional career.

Mr. Wight's contributions to the professional literature were many, varied, and instructive. His history of the Chicago Chapter of the A. I. A. teems with interest and will long keep his memory green in the hearts of its members, his friends to whom, as to all, he gave himself without stint.

Whereas: In the passing of Peter B. Wight the Chapter and the profession have lost a vital force for good, a companionable and friendly spirit, therefore be it Resolved:

That the Chicago Chapter A. I. A. record its deep sense of loss and that these words of respect be spread upon the records of the Chapter and be transmitted to the intimate family through the beloved sister who ministered to the talented brother in his declining years.

(Signed) IRVING K. POND
ARTHUR WOLTERSDORF
For the Chicago Chapter, A. I. A.

SCOTLAND'S WAR MEMORIAL

CONSIDERABLE progress has been made with the reconstruction of the old barrack building on Edinburgh Castle rock into a Gallery of Honor, which is to form, with a shrine on the north side, the Scottish National War Memorial. The sculpture of the great arch, nearly 30 ft. high, that leads from the gallery into the shrine, has already been completed. The latter has been carried up to the level of the springing of the stone vault. At each end of the Gallery of Honor there is to be a window, one to the Navy and the other to the Air Force. The bays for the memorials to the twelve historic Scottish regiments and other units are taking shape, and the doorway forming the lower story of the porch—which will be the central feature of the exterior looking south into Crown-square—is completed. The work is under the supervision of the architect, Sir Robert Lorimer, A.R.A.

DRY ROT IN TIMBER

THE question of dry rot in timber is of great importance to the architectural profession and the building industry, and it is well that the best methods of identifying and dealing with it should be known, writes *The Builder,* London. Alan E. Munby, in referring in *The Times,* of London, to the help given him by the Natural History Museum in identifying fungi in building timber, says the subject embraces a cause of immense annual loss to the country and upon which much remains to be learnt. "The ravages of dry rot," he states, "which often involve the partial demolition and reconstruction of buildings, are so common and widespread that it seems extraordinary that more research upon the diseases included in this term are not in progress. Besides the Natural History Museum, the Imperial College and (quite lately) the Department of Industrial Research deal with this subject, but only in a very limited manner, and not on a scale at all commensurate with the importance of the problem. . . . The Royal Institute of British Architects has been pressing the need for research on dry rot from time to time for some years, and the British Science Guild has recently had the subject before it for discussion as one of national importance."

THE AMENITIES OF OXFORD

JAZZ electric signs, we are informed, are not to be allowed in the City of Oxford under a town planning scheme that is at present under consideration, states *The Builder,* London. It is felt that night signs having the appearance of intermittent illumination of roof signs are quite out of place in the University City, and accordingly it is proposed under the preliminary scheme to prohibit these. Power is also to be taken to prevent the erection of buildings of a height greater than 50 ft., exclusive of chimneys, towers and turrets. The area, as approved by the Ministry of Health, covers nearly 20,000 acres in all, and if confirmed, Oxford will be the first city in Great Britain to obtain powers to control her built-up area. At present a cinema could be put up next to Christ Church, or a mammoth store opposite Magdalen, or a galvanized sheet iron garage close to Balliol. In view of the immense number of American and other visitors during the Summer the City Council consider it imperative for commercial as well as for æsthetic reasons to safeguard the character of their City and to improve its amenities.

NISSEN TYPE OF HOUSES IN ENGLAND

THE Nissen type of house, which was recently erected at Yeovil, in Somersetshire, is being adopted in other parts of the country, writes *The Architectural Review,* London. In appearance, the house somewhat resembles a magnified army hut of the type known as the Nissen hut, with certain architectural improvements. The Queenborough Borough Council have invited tenders, but are proposing to substitute brick for concrete, as it is thought possible that in this instance brick construction will be cheaper. The Borough of Ipswich is proposing to obtain tenders for a sample pair of parlor-type houses, also of brick construction. Several tenders for the erection of the Nissen-Petren type of house have been approved in the Yeovil district, and schemes are in contemplation around Tiverton. Several Government Departments are investigating the suitability of this type of house for their own requirements.

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NEW BUILDING CRAFTS SCHOOL, LIVERPOOL, ENGLAND

THE Liverpool Education Committee has recently opened a new day school for instruction in the building crafts at the premises in Fontenoy Street which were, until lately, known as the Lord Roberts' Memorial Workshops. The classes will be attended by apprentices in the various sections of the building trade, and the program of instruction will be so shaped as to make students at the end of their course, much more thorough masters of their craft than they could ordinarily hope to become by merely doing the work which falls to the lot of apprentices in the workshops of their masters.

CANADA'S HIGHWAY COST FOR 1924

A REPORT prepared by A. W. Campbell, Dominion Highways Commissioner, discloses the fact that during the year 1924 there was expended upon the roads of Canada a total of $31,413,097, of which $23,000,000 was for construction, $1,500,000 for reconstruction and about $7,000,000 for maintenance. The total expenditure was $10,000,000 less than that of the previous year.

THE KITCHENER MEMORIAL

THE Kitchener War Memorial Tower, which is being erected at Marwick Head, Birsay, Orkney, England, overlooking the spot where *H.M.S. Hampshire* was lost, was recently unveiled. The inscription reads as follows: "This tower was raised by the people of Orkney in memory of Field-Marshal Earl Kitchener of Khartoum, on that corner of his country which he served so faithfully nearest to the place where he died on duty."

PERSONALS

Blackall, Clapp & Whittemore, architects, have moved their offices from 20 Beacon Street to 31 West Street, Boston, Mass.

Katherine Cotheal Budd, architect, Room 2120, 342 Madison Avenue, New York City, wishes to receive manufacturers' catalogs and samples.

Hugh T. Keyes, architect, has moved his office from 423 Murphy Building to 635 Free Press Building, Detroit, Mich.

Clarence C. Palmer, architect, has moved his office from the Professional Building to 300-304 City Hall, New Britain, Conn.

Charles H. Crandall, architect, has moved his office from 187 High Street, Springfield, Mass., to Randolph, Vt., Box 238.

Randolph H. Almiroty, architect, has moved his office from 48 West Forty-sixth Street to 2 West Forty-fifth Street, New York City.

Gilbert Stanley Underwood and Company, architects and engineers, announce the removal of their offices to 730 South Los Angeles Street, Los Angeles, Cal.

George Roth, architect, announces the opening of offices for the general practice of architecture at 578 Summit Avenue, Jersey City, N. J. Manufacturers' catalogs and samples are desired.

Karl F. J. Seifert, architect, wishes to announce that his office is now located at 3029 Third Avenue, near One Hundred and Fifty-sixth Street, New York City.

Willis C. Lowe, architect, has moved his office from the Monadnock Building, San Francisco, to the Builders Exchange Building, 354 Hobart Street, Oakland, Cal.

Fred Young, architect, has moved his office from the Empire Building to 212 East Sixth Street, Bartlesville, Okla., where he would like to have manufacturers send catalogs and samples.

Angelo Zucco, architect and engineer, has closed his office at Albuquerque, N. M., and has moved to Chicago, Ill., 4241 Broadway, where he intends to reopen an office in the near future.

Alexander Fraser Rose, architect, has moved his offices from 510 Essex Building, Minneapolis, Minn., to 14 Roney Building, Sixth Street and Collins Avenue, Miami Beach, Fla.

Meginnis & Schaumberg, architects, have moved their office from the Bankers Life Building, to the Nebraska State Building, Lincoln, Nebr.

Eliel Saarinen, architect, has recently returned from a Summer spent at his home in Finland, and is located for the coming year at Cranbrook, Birmingham, Mich., where he is engaged upon a civic development.

The Huseman Company, architects, have moved their office from 606 Amicable Life Building, Waco, Texas, to 901 South Seventeenth Street, Chickasha, Okla. Manufacturers are requested to send catalogs and samples.

Leon F. Urbain, architect, has recently returned to practice in Chicago, Ill., after an absence of seven years in France. Mr. Urbain would appreciate having manufacturers send new catalogs and samples to his office at 1254 Lake Shore Drive.

A short while ago the building at 2532 West Seventh Street, Los Angeles, Cal., in which was located the architectural office of G. Whitecross Ritchie, was badly damaged by fire and Mr. Ritchie's office practically gutted out. His temporary mailing address is now 303 Parkview Building, 2404 West Seventh Street, that city.

The PUBLISHERS' PAGE

THE AMERICAN ARCHITECT has consistently published articles dealing with sound and acoustics since the beginning of the study of these matters by the late Professor Sabine of Harvard University. Although a large amount of scientific data has been developed through the research of specialists and been published in this journal, THE AMERICAN ARCHITECT is pleased to announce that it has been selected by the Bureau of Standards to publish first the results of a recently completed series of tests, entitled The Sound Insulating Properties of Partition Walls (chiefly lath and plaster), by E. A. Eckhardt and V. L. Chrisler. Tests were made of thirty-four panels, covering a wide range of construction. Increasing attention is being given to the subject of sound insulation and this article will be found of the utmost value to architects and acoustical engineers. It will appear in the November 5 issue.

* * *

The following editorial clipped from *The Architect and Engineer,* of San Francisco, discloses a situation that is of first importance to architect, client and contractor, but particularly to the first two. Editorial reference to this matter will be found on another page of this issue. The clipping, appropriately headed "Stacking the Cards," states:

"We are all familiar with the magician who takes a pack of playing cards and smilingly asks you to accept one—'any one in the pack'—and you do so.

"Only the magician knows what card you selected because he forces a card on you without you knowing it, and he does it so quickly and so skillfully that he convinces you the hand is quicker than the eye.

"When the architect prepares his plans, details and specifications, he invariably has in mind using a certain make, brand or quality of material or equipment. Instead of using the material as specified, the contractor sometimes substitutes material of possibly inferior quality.

"For example: A Los Angeles paint concern had its material specified in sixty known instances by various architects last year. A check up of the jobs showed that in only twenty-one cases was the material used 'as specified.' Substitutes were used in the other instances.

"Such flagrant disregard of specifications, if carried to excess, is quite liable to injure seriously the reputation of the architect. The client, too, is likely to suffer. Manufacturers who advertise their products can usually be depended upon to maintain quality and price standards. If architects are influenced by this advertising (and they should be) and then the contractor substitutes inferior goods, the manufacturer is not getting a square deal; neither is the architect nor his client. Specify advertised material and equipment in fairness to everyone and follow it up by insisting that the work be done according to specifications."

* * *

Mr. Bossom's article on the Paris Exposition, presented in a recent issue, has provoked much correspondence from readers. The preponderance of opinion is summed up by a correspondent who writes:

"Is it possible that the Anglo-Saxon mind is taking the Paris Exposition too seriously? I remember hearing Professor Despradelles say, a number of years ago, of the Chicago World's Fair, that the architecture was not exposition architecture at all according to the French idea; that to the Frenchman the temporary nature and object of exposition buildings was looked upon as giving an opportunity to design something gay, fantastic, arresting, even *incroyable;* to play with architecture; to build dreams,—even nightmares,—rather than imitation utilitarian buildings of the past or present. Perhaps this was their aim."

* * *

From first to last, from our first issue in 1876 to this present one, there have been subscribers and patrons of this journal to whom we pridefully refer. We have before us a letter from Albert A. Post, of Buffalo, N. Y., that is a cherished possession. Mr. Post writes us:—"I have been a subscriber *from the first number* of your publication till the present time. I was a pupil in an architect's office when your first number was issued, and to help along its good work, I subscribed for it. So I have seen it from its infancy, and trust it will still keep growing and doing its great work." Fifty years of friendship for this journal, a half century of consistent support, is a friendship to point to with pride and steadily work to retain.

* * *

Professor Ralph Adams Cram's notable series on Cataluñan Architecture begins with this issue, and will appear monthly, running to four articles. This series is a notable contribution to the history of Gothic architecture.

* * *

Our esteemed contributor, Egerton Swartwout, having been unexpectedly called to Europe, he has been prevented from preparing the usual monthly review of current architectural press. There has been culled from the foreign journals a series of suggestive illustrations that will mark the progress of architecture in Europe and these are presented in this issue in lieu of Mr. Swartwout's article.

PRINCIPAL ENTRANCE, PALAZZO SACRATI, FERRARA